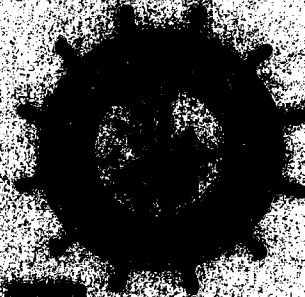


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FINAL REPORT OPERATION AND MANAGEMENT AREA WATER ASSESSMENT



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GREAT RIVER RESOURCE
MANAGEMENT STUDY - GREAT III
MISSISSIPPI - RIVER MILE 301-0

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recreation use for the years 1990 and 2000 were translated into land needs and use-intensity measures. Accordingly, intensity of use (as measured in visitor days per acre of recreation land) may double by the year 2000, resulting in a deficit of nearly 36,000 acres of recreation lands. ←

FINAL REPORT:
RECREATION AND NATURAL AREA NEEDS ASSESSMENT

Prepared for:
The Great River Resource Management Study - GREAT III
Upper Mississippi
River Mile 301-0

Prepared by:
Oblinger-McCaleb
Architects, Engineers, Planners, and Landscape Architects
Wichita, Kansas

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ERRATA SHEET

The following corrections should be noted in the Final Report:
GREAT III Recreation and Natural Area Needs Assessment.

1. On page 57, the average LAI in Table 19 should be 12.30 instead of 13.20.
2. On page 59, the last sentence in the second paragraph under Option II should read 36,000 additional acres rather than the typed 6,000.
3. On page F-2 of Appendix F, counties listed are in Missouri rather than Illinois, so column heading should indicate Missouri counties.

ACKNOWLEDGEMENTS

Oblinger-McCaleb wishes to acknowledge the assistance of those who helped prepare the GREAT III Recreation and Natural Area Needs Assessment. The study would not have been possible without the efforts of the following people and entities.

Don Kurz, Natural History Specialist
Missouri Department of Conservation

Mr. Kurz was Principal Investigator for the Natural Areas Inventory 1981 which was prepared by the Missouri Department of Conservation under contract to Oblinger-McCaleb.

Dr. Robert Becker

Dr. Becker provided the original research design for the study, determined on-site interview sampling procedures, provided use estimates and projections, and supplied computer services for the project. In addition, his leadership and guidance throughout the project was invaluable.

Dr. Becker has many years experience in river recreation planning and evaluation and has authored numerous articles on these subjects. He was formerly with the University of Wisconsin, and is currently Director of the Energy and Resource Development Institute and Associate Professor at the Clemson University College of Forestry and Recreation Resources.

Dr. Alan Everson

School of Forestry, Fisheries and Wildlife
University of Missouri - Columbia.

Field work for the on-site interviews in the northern portion of the study area was conducted by the University of Missouri at Columbia. In addition, the University was responsible for conducting the regional telephone survey which formed the backbone of the analysis of latent demands. Dr. Alan Everson of the School of Forestry, Fisheries, and Wildlife directed both activities. Separately, Dr. Everson devised the specific methodology and questionnaire for the regional telephone survey in conjunction with Oblinger-McCaleb. In addition, Dr. Everson was a continuing source of expertise and direction throughout all aspects of the study.

Dr. Dwight McCurdy
Dr. John Burde
Department of Forestry
Southern Illinois University - Carbondale

Field work for the on-site interviews in the southern portion of the study area was conducted by Southern Illinois University - Carbondale under the direction of Dr. John Burde and Dr. Dwight McCurdy of the Department of Forestry. These individuals were also responsible for conducting traffic counts at the Jefferson National Expansion Monument.

Without the guidance and comments of the Work Group, the study could never have been satisfactorily completed. A complete list of Work Group members and the entities which they represent is shown in Appendix I.

United State Department of the Army
Corps of Engineers - St. Louis District

The Corps offered guidance and assistance throughout the project. Population projections for year 1990 and 2000 used in the study were developed and supplied by the Corps. In addition they provided a boat for a tour by the Work Group in conjunction with the study.

Jim Walker
Walker & Associates

This firm provided the aerial photography used in the study.



Handwritten notes on a document:

- Top left: "Handwritten notes" (faint)
- Top right: A table with 2 columns and 5 rows. The first row is checked with a large 'X'.
- Bottom left: A large handwritten 'A'.
- Bottom right: A large handwritten 'B'.

SUMMARY

The Mississippi River "GREAT III Recreation and Natural Area Needs Assessment" was prepared under contract to the United States Department of the Army, Corps of Engineers -- St. Louis District. This summary presents major findings of the study for GREAT III, a 301-mile reach of the Mississippi ranging from approximately Saverton, Missouri to Cairo, Illinois.

During an inventory of natural areas, fifty-nine unique geologic or biological communities were identified. The inventory includes location, ownership, type and significance of each site along with a map series showing each area. This information is included as a separate, free-standing appendix to the study and is entitled "Natural Areas Inventory, 1981".

A "Recreation Area and Facility Inventory, 1981" was also prepared as an appendix to the study. This document includes the name, location, and characteristics of recreation sites as well as individualized comments. A map series is included which shows the geographic location of areas and facilities.

Utilizing an on-site interview system, recreation activity for 1981 was measured. There were 448,400 recreation visitors to GREAT III in 1981 based upon results of the interviews. The average size of the recreation party was 2.86 persons. Over 93% were repeat users, and 49.4% used the river six or more times per year. The vast majority (88.2%) arrived by car, truck, or van, while 9.6% of the parties were in groups of two or more vehicles. Approximately 81.9% of the respondents resided within 50 miles of the recreation sites at which they were interviewed.

Activities reported by recreationists were quite varied. The most frequent individual activities were Viewing the River and Loafing/Relaxing -- reported by 44.1% and 38.5% of river users, respectively. Runabout Boating was reported by 22.7% of recreationists and ranked as the third most frequent activity. Boat Fishing (16.8%) and Bank Fishing (15.0%) were common as were Picnicking (21.5%), Water Skiing (17.7%), and Swimming (14.7%). Differences between areas within the GREAT III reach are explored in the text of the study.

A second survey was conducted by telephone to determine latent, or unexpressed, demands of the population-at-large along GREAT III. Interviewees were asked what improvements or conditions would increase their recreation participation on the Mississippi. By far the most common response was Clean Up the River, an answer given by nearly ten percent of interviewees.

Projections of future recreation use for year 1990 and 2000 were prepared under two alternative assumptions. First, it was assumed that recreation use would increase in direct proportion to population growth. A second projection was made based upon the telephone survey respondent's planned

— increase in Mississippi river activity. A resultant range of visitation for 1990 was projected to be 549,500 to 692,200 visitor-days, growing to a range of 567,000 to 890,000 by year 2000.

These projections were then translated into land needs, and use-intensity measures. According to these projections, intensity of use (as measured in visitor-days per acre of recreation land) may double by the year 2000, resulting in a deficit of nearly 36,000 acres of recreation lands.

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INTRODUCTION

INTRODUCTION

Authorization for Study

The "GREAT III Recreation and Natural Area Needs Assessment" was prepared under contract to the United States Department of the Army, Corps of Engineers -- St. Louis District. The effort was part of a comprehensive river management study program designed to enhance river management in the future. Under the auspices of the Corps of Engineers and its designated advisory body, the GREAT III Recreation Work Group, this report is presented in three parts:

- a) Natural Area Inventory, 1981
- b) Recreation Area and Facility Inventory, 1981
- c) Final Report: GREAT III Recreation and Natural Area Needs Assessment

The inventories are presented as two separate, free-standing documents, while the methods, findings and supportive materials for the remainder of the study are included in this Final Report.

Purpose and Scope

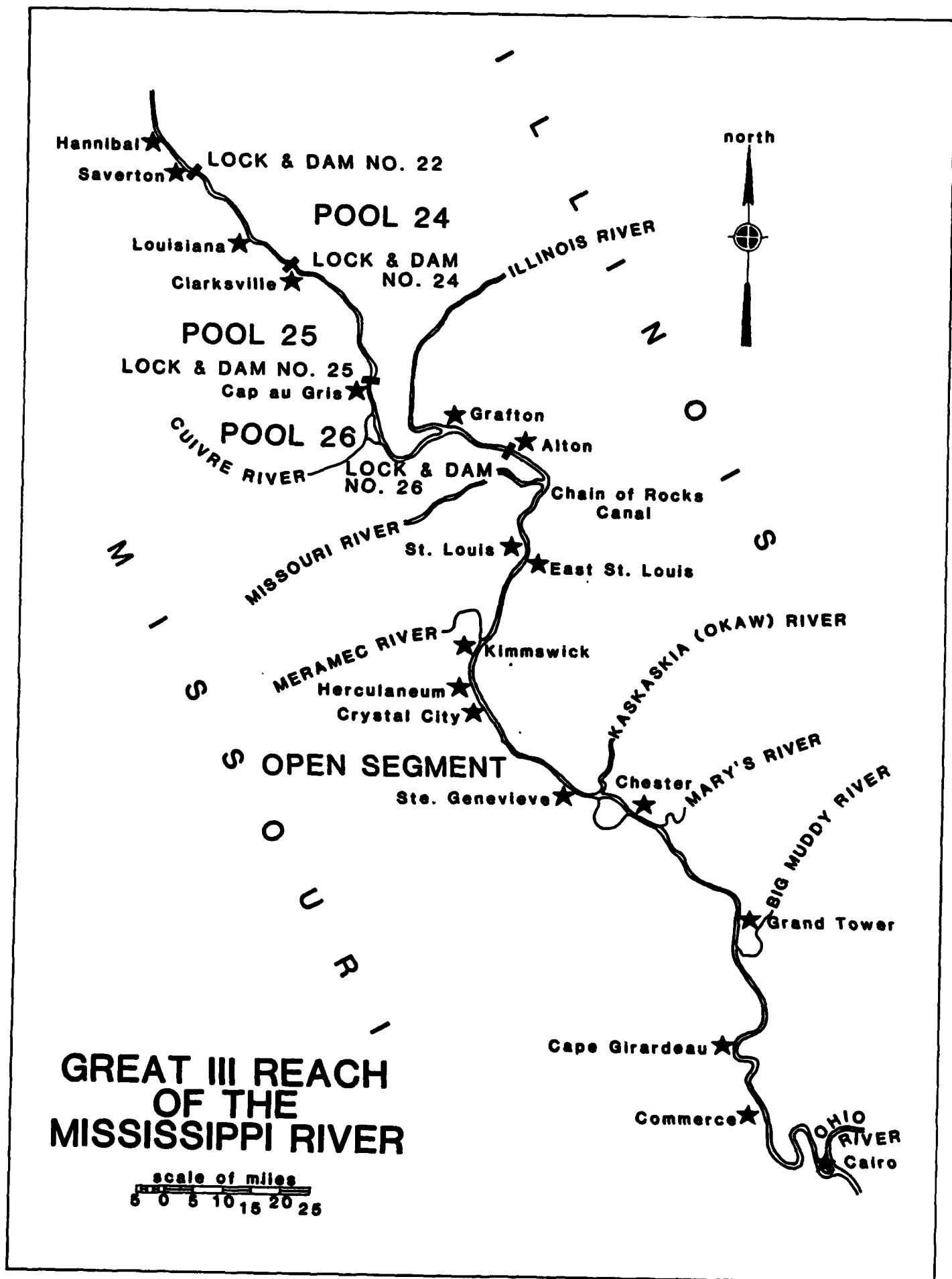
This study was prepared to provide an overview of recreation activity on the 301 mile reach of the Mississippi River approximately bounded by Saverton, Missouri on the north and Cairo, Illinois on the south. Natural areas of unique geologic or biological importance were inventoried to enhance protection of these areas. Current and future recreation use patterns were estimated and translated into year 1990 and 2000 land requirements and intensities under optional scenarios of the future. Thus, a macro-analytical tool was created for use by recreation managers and decision-makers in developing long range plans. Specific facility or site requirements were beyond the scope of the study.

Description of the Study Area

The study area included the main stem of the Mississippi River and its flood plains and bluffs from Saverton, Missouri (Lock and Dam 22) to Cairo, Illinois (at the mouth of the Ohio River). Because of their importance as scenic overlooks, bluff top areas extending 300 feet beyond the bluffs crest were also included. Map 1 shows the GREAT III reach of the Mississippi River.

The 301 mile segment was divided into four distinct study areas for the purpose of differentiating between geographic subunits of GREAT III. The four divisions and their boundaries are:

<u>Area</u>	<u>Upstream Boundary</u>	<u>Downstream Boundary</u>
Pool 24	Lock and Dam 22 River Mile 301.3	Lock and Dam 24 River Mile 273.4
Pool 25	Lock and Dam 24 River Mile 273.4	Lock and Dam 25 River Mile 241.5
Pool 26	Lock and Dam 25 River Mile 241.5	Lock and Dam 26 River Mile 202.9
Open Segment	Lock and Dam 26 River Mile 202.9	Ohio River River Mile 0.0



METHODOLOGY

METHODOLOGY

The purpose of the study was to assess recreation and natural area needs in the study area. In order to determine these needs, six major tasks were undertaken. Each is briefly outlined in the following overview.

1. Study Design and Familiarization Trip

A research design was developed and distributed to the Recreation Work Group and Corps of Engineers for approval. This design set forth the techniques to be used in the subsequent tasks described below. In addition, a member of the Consultant team conducted an on-site familiarization trip along the 301 mile river segment.

2. Inventories of Recreation and Natural Areas

Two separate inventories of existing lands were undertaken. One was an inventory of unique biological and geologic communities in the study area. This inventory was prepared by the Missouri Department of Conservation under contract to Oblinger-McCaleb. The inventory methods, findings, and resultant maps are presented in a separate, free-standing document entitled "Natural Areas Inventory, 1981", which is considered as Appendix A of this report.

The second inventory was comprised of recreation areas and facilities along the GREAT III reach of the Mississippi. This inventory, compiled from secondary sources without field-checking, was intended to serve as the basis of later on-site activity observations and as a source of acreage data for the current supply of recreation lands. This inventory, considered Appendix B of this report, is also presented in a separate, free-standing document: "Recreation Areas and Facility Inventory, 1981".

3. Current Use Assessment

A study of recreation facilities was conducted to provide estimates of activity on the GREAT III reach. A sampling of selected sites were surveyed through an on-site interview system. Interview data were then transformed into activity and visitor estimates.

4. Latent Demand Analysis

A regional telephone survey was conducted to determine latent, or unexpressed, recreation demands. In addition, this survey was used to corroborate the recreation use estimate from the on-site survey by providing an independent, comparative use estimate.

5. Projections of Recreation Use

Utilizing results of the two previous stages, recreation participation in various activities was projected for year 1990 and 2000. In addition, projections of latent demand were estimated based on the results of the regional telephone survey.

6. Surfeit-Deficit of Recreation Lands

Based upon recreation visitation and the supply of existing recreation lands, an analysis of the surplus or deficit of recreation lands was prepared. This was measured for years 1981, 1990 and 2000. Land requirements associated with the capture of latent demands were also estimated.

With the exception of the Recreation and Natural Areas Inventories -- both presented in separate documents, the methodology employed in this report is detailed below. Also documented below are calculations of error estimates and confidence intervals for estimates of current use measured through both on-site interviews and the regional telephone survey.

CURRENT USE ASSESSMENT

Establishment of Use Estimates

Use estimates for this study combined several observational techniques: on-site interviews at selected sample times, dates and locations; aerial photography; and traffic count volumes. These methods were combined for several reasons.

The diverse nature of areas and activities along the Mississippi River are such that no single technique is applicable. A sampling procedure using counts based on personal interviews with recreationists was determined to be the predominant means of data collection. This method has much more credibility and control than simple observational estimates made by recreation managers or administrators. Total counts completely enumerating recreation use and users in a total inventory of activities would be a logistical impossibility and would generate prohibitive costs. Consequently, a sampling procedure was necessary.

Application of data from aerial photography was used in two ways. To create the appropriate samples, primary data was extracted from aerial photography to glean information on user density and distribution. This provided guidance in sample selection by site and use type. In the late summer of 1981, aerial photographs were taken concurrent with field interviews. Use of aerials is described in Appendix C, page C-9.

Counts of traffic volume were utilized in one portion of the survey. Because of the large number of visitors to the Jefferson National Expansion Memorial, traffic volume was sampled on this entire recreation site instead of interviewing a sample of on-site visitors. This single high-volume site would otherwise have skewed the entire study of typical Mississippi River recreation activities (see Appendix C, page C-10).

Sampling Procedure

A number of considerations were involved in determining a sampling strategy. First, the nature of resource use involves the spatial characteristics of recreation on the natural resource base. For example, campsite recreation users exhibit cluster use patterns (Becker-1976,1978). Users tend to gravitate to specific locations, then utilize the space in a concentric fashion forming a zone. Trails system users (Murray, 1974), riverway users (Becker, Niemann and Gates, 1979; Carls, 1978) and parkway users (Noe, Hampe, and Malone, 1978) exhibit a general linear behavior. Users tend to move "through" the resource rather than segregate themselves to specific zones.

Second, resource use variations such as time of day, day of week, and varying seasons of the year are important considerations in constructing a representative sample design. Similarly, variations in the types of use (various activities, group sizes, and day use versus extended stay) and sporadic resource fluctuation should be represented adequately in sample designs.

Third, associating sample strategies with objectives of the research involves understanding limits of the data obtained relative to the information needed. A sampling design that accidentally favors specific users or time of use may render eventual management actions counter to actual resource needs and user expectations (Schreyer and Roggenbuck, 1978).

Field sampling procedures for the GREAT III reach of the Mississippi River focussed on all known recreational facilities and features. These were identified in the GREAT III "Recreation Inventory, 1981" prepared by Oblinger-McCaleb. The selection of sites was based upon the facility type and location as defined in that document.

Sites were delineated into Marinas, Boat Ramps, and Other categories. Marinas were differentiated by slip numbers present, while Boat Ramps were classified by surface type: Hard Surface, Concrete Plank, Gravel, and Non-Surfaced. The Other category was sampled with consideration to location and representativeness of varied use patterns. This was a quite diverse category including parks, bikeways, refuges, picnic grounds, and various other entities.

These various sites were sampled appropriately during spring, summer, fall and winter seasons based upon the detailed study on Pool 21 conducted by Fleener. In accordance with this study, the sampling of interviews by season of the year were distributed as follows:

Spring/Summer	(March 17 to August 31)	81.5%
Fall	(September 1 to January 12)	15.6%
Winter	(January 13 to March 16)	2.9%

While known sample proportions for site types and seasonal variation were available for determining sample structure, the recreation use of sites at specific times was not known and required application of arbitrary probability techniques used in previous studies (Jessen, 1978; Fleener, 1975).

Each recreation party was interviewed on-site during the period sampled. Thus, busy sites generated more interviews than sites with little activity.

In order to account for any needed information regarding site characteristics that might influence recreation use, a number of data items were included on the on-site interview and observation form developed for the survey. Such observations included weather conditions, temperature, wind condition, water conditions, and river stage. These data are available and specific to each interview situation at each site.

The questionnaire/observation form used to collect survey information is included in the Appendix C of this report. It should be noted that the instrument was prepared to collect information on the site and site conditions as well as activities of recreationists. Also included in the Appendix C is the multiple card record layout form for the data tapes used to store the information, and various program documentation for computer analysis.

The Sample

During the course of the fieldwork, 2956 on-site interviews were conducted at 56 sites. A complete listing of interview sites, location, and number of interviews is shown in Table 1.

Interviews were conducted in each study area within the GREAT III boundaries. Based upon the sampling procedures described above, the sample was divided in the following manner:

<u>Area</u>	<u>Sites</u>	<u>Interviews</u>	<u>Percent</u>
Pool 24	9	490	16.7%
Pool 25	11	659	22.5%
Pool 26	21	1259	43.0%
Open Segment	15	520	17.8%

In addition, interview sites were sampled in all seasons. The total interviews were distributed as indicated below. It should be noted that Oblinger-McCaleb revised Fleener's definition of the winter season to include all of March. Thus, winter was defined as January 12 through March 31. Results of the sampling procedure generated activity percentages very similar to the Fleener Study.

<u>Season</u>	<u>Fleener</u>	<u>Oblinger-McCaleb</u>
Spring/Summer	81.5%	78.6%
Fall	15.6%	17.8%
Winter	2.9%	3.6%

The breakdown of interviews by time-of-day was another sampling distinction. Results showed a ratio of 1.49:1 of morning to afternoon activity. This translates to 59.9% of interviews in the morning hours and 40.1% in the afternoon. Because day-of-week was also a sampling factor, the weekend to weekday ratio has also been calculated for each season and is shown in Table 2 of page 12.

Specific detail regarding conversions for calculation of the use estimate are presented in the immediately succeeding paragraphs. Additional information regarding the sample characteristics and addressing site specific conditions at each interview are available from Oblinger-McCaleb on a site by site basis. Because this data is probably only useful on a site specific basis and for internal adjustment to the data, it is not replicated in this report. The data will be on file at the Corps of Engineers in St. Louis.

TABLE 1

INTERVIEW LOCATIONS AND COUNTS FOR CURRENT USE ASSESSMENT

INTERVIEW SITE	RIVER MILE	STATE	AREA	INTERVIEWS
Park and Fish				
Lock & Dam 22	301.2	Illinois/Missouri	Pool 24	106
Ted Shanks Area	285.0-293.0	Missouri	Pool 24	73
Pike Station Access	284.2	Illinois	Pool 24	31
Cruise Boat Dock	283.5	Missouri	Pool 24	9
Two Rivers Marina	283.2	Illinois	Pool 24	136
Riverview Park	283.1	Missouri	Pool 24	1
Louisiana Boat Club	283.0	Missouri	Pool 24	111
Little Calumet Creek				
Public Access Area	277.1	Missouri	Pool 24	5
Calumet Sales and Service	277.0	Missouri	Pool 24	12
Clarksville Boat Club	273.1	Missouri	Pool 25	52
Rip-Rap Landing				
Conservation Area	265.3	Illinois	Pool 25	51
Clarence Cannon Refuge	261.9	Missouri	Pool 25	7
Timberlake Lodge	257.5	Missouri	Pool 25	101
Hatfield Landing	254.8	Missouri	Pool 25	49
Red's Landing	254.0	Illinois	Pool 25	43
Mourfee's	251.7	Missouri	Pool 25	2
Boyd's Landing	250.9	Missouri	Pool 25	24
Behren's	250.6	Illinois	Pool 25	13
Sterling Harbor	250.5	Missouri	Pool 25	63
Calhoun Sportsmen	243.0	Illinois	Pool 25	111
Presley's Acre Marina	241.4	Missouri	Pool 26	204
West Point Ferry Landing	240.9	Illinois	Pool 26	44
Peruque Harbor	231.6	Missouri	Pool 26	171
Dardenne Boat Harbor	227.3	Missouri	Pool 26	2
Yacht Club of St.Louis	225.0	Missouri	Pool 26	168
Royal Landing	223.0	Missouri	Pool 26	20
Woodland Marina, Inc.	222.7	Missouri	Pool 26	90
Pohlman Lake	222.0	Illinois	Pool 26	47
Pere Marquette State Park	-	Illinois	Pool 26	111
Sherwood Harbor Marina	219.0	Missouri	Pool 26	59
Grafton Public Access Area	218.1	Illinois	Pool 26	87
Hideway Harbor	214.0	Missouri	Pool 26	4
Sioux Yacht Club	212.9	Missouri	Pool 26	9
Portage des Sioux Yacht Club	212.6	Missouri	Pool 26	16
Our Lady of the River	212.5	Missouri	Pool 26	15
Palisades Yacht Club	212.2	Missouri	Pool 26	39
McAdams Parkway	-	Illinois	Pool 26	20
Valley Sailing Association	210.5	Missouri	Pool 26	14
Piasa Harbor	209.4	Illinois	Pool 26	214
Alta Villa	205.5	Missouri	Pool 26	41
Lock and Dam 26	202.8	Illinois/Missouri	Pool 26	87

TABLE 1 (Cont'd)

INTERVIEW LOCATIONS AND COUNTS FOR CURRENT USE ASSESSMENT

INTERVIEW SITE	RIVER MILE	STATE	AREA	INTERVIEWS
Lewis & Clark State Park	194.8	Illinois	Open	23
Chain of Rocks Access Area	190.3	Illinois	Open	24
Hoppies Landing	158.9	Missouri	Open	99
Herculaneum Access	152.0	Missouri	Open	7
Fort DeChartres State Park	133.5	Illinois	Open	41
Little Rock Ferry Landing	125.5	Missouri	Open	2
Fort Kaskaskia State Park	116.5	Illinois	Open	64
Chester Boat Ramp	109.5	Illinois	Open	21
Claryville Access	109.0	Missouri	Open	2
Grand Tower Access Area	79.5	Illinois	Open	26
Trail of Tears State Park				
John Wescoat Marina	66.5	Missouri	Open	35
Cape Rock Park Access	54.0	Missouri	Open	12
Cape Girardeau Riverfront				
Area	52.1	Missouri	Open	55
Commerce Park Access	39.4	Missouri	Open	2
Fort Defiance State Park	1.0	Illinois	Open	57

Use Estimate From Field Questionnaire Sampling

This section describes the procedures used to derive a use estimate for the GREAT III reach of the Mississippi River. This particular use estimate was generated from the on-site questionnaires and sampling procedure. Recall, from the earlier sample selection process description, that representative sites along the GREAT III reach were selected for questionnaire distribution. Questionnaires were handed out at each site on a constructed week basis. That is, each site was sampled on weekdays and weekends and on morning and afternoon periods. These sampling procedures were repeated over a three season distribution (spring/summer, fall and winter). Table 2 (page 12) illustrates the questionnaire distribution which resulted from the sampling scheme for the study period and the ratio of weekday to weekend in each season.

The weekend/weekday ratios (Table 2, page 12), A.M./P.M. ratios (Table 3-b, page 12), and seasonal ratios (Table 3-a, page 13) were used to construct an estimate of total year use for each sampled site.

To develop the total reach use estimate, each sampled site was individually analyzed. The date of each sample period was recorded and sample counts were tallied as to weekday/weekend and A.M./P.M. within each season. Weekday/weekend means and A.M./P.M. means were then multiplied by the respective ratios to derive use estimates for periods not sampled. Table 3 illustrates the ratios, for the site use estimate, which were used to construct site use figures.

This process was repeated for every sampled site which had at least .5% (or 15) to total groups sampled.

The figure developed for each site represented an estimate of the total number of groups which visited the site for the study period. Total groups was then multiplied by 2.86 persons per group to derive an estimate of total visitors for each site for the study period. The 2.86 multiplier represents the average group size reported by the total GREAT III sample.

Once all sampled site use estimates were completed, sites were classified as to their physical characteristics, i.e., number of slips; types of launch ramps; size of parking area. Table 4 (page 14) shows this classification and the mean use attributed to each site characteristic (i.e., per slip for the study period).

A use estimate for each site not sampled was developed by multiplying the characteristics of the unsampled site by the mean value for each characteristic. When a site had multiple features (i.e., a launch ramp and slippage) use for the site was calculated for each item and the average of those values was recorded as the site use estimate. Use estimates for all sites in the population were then added to produce a total and pool river visitor day estimate. Table 5 summarizes all figures to this point.

To estimate activity days for the GREAT III reach, the percent of parties reporting participation in each surveyed activity was recorded. This value was then multiplied by the total visitor day estimate. Results of this computation of visitor participation by each study activity is reported in the section entitled "Findings" and is shown as Table 6, page 26.

TABLE 2

Weekday/Weekend ratios by Season and Total Sample
Distribution by Season for the GREAT III Reach of
The Upper Mississippi River

<u>Season</u>	<u>Ratio Weekend/Weekday</u>	<u>% of Sample</u>	<u>N</u>
Winter	4.60: 1	3.6%	106
Spring/Summer	2.84: 1	78.6	2,321
Fall	3.37: 1	17.8	<u>526</u>
			2,953*

* The difference between the total N of 2959 is due to six cases having no date recorded.

Note: The distribution of use by season for Fleener's detailed Pool 21 study was: Winter: 2.9%; Spring/Summer: 81.5%; and Fall: 15.6%. Our sample distribution compares favorably with this prior census study.

TABLE 3

Conversion Matrixes Used to Develop 1981 Site Use
Estimates for the GREAT III Reach of the Upper
Mississippi River

A. 1981 Season Conversion Matrix

	<u>Spring/Summer</u>	<u>Fall</u>	<u>Winter</u>
Spring/Summer	1	4.35	20.0
Fall	.23	1	4.76
Winter	.05	.21	1

B. A.M./P.M. Conversion Matrix

	<u>A.M.</u>	<u>P.M.</u>
A.M.	1	.60
P.M.	1.67	1

* The A.M./P.M. conversion ratios were, when available, calculated for each site, otherwise the total river ratios (as expressed in matrix) were applied.

C. Weekday/Weekend Conversion Matrix

	<u>Spring/Summer</u>		<u>Fall</u>		<u>Winter</u>	
	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend
Weekday	1	.35	1	.30	1	.22
Weekend	2.84	1	3.37	1	4.60	1

D. Weeks Per Season for Constructed Week Multiples

Spring/Summer	22
Fall	18
Winter	12

TABLE 4

Marina and Ramp Sample Counts Used for the 1981
GREAT III Upper Mississippi River Use Estimate

A. Marinas:

<u>Marina Size</u>	<u>Slips Per Category</u>	<u>Total Use*</u>	<u>Mean Use Per Slip</u>
0 - 30	81	33,222	410
31 - 45	407	60,800	149
76 - 100	278	14,677	53
101+	555	19,539	35

B. Ramps:

<u>Surface Hard</u>	<u>Ramp Parking Size</u>	<u>Parking Space Per Category</u>	<u>Total Use*</u>	<u>Mean Uses Per Parking Space</u>
	1 - 25	100	14,161	141
	26 - 50	155	28,471	183
	51 -125	396	36,838	93
	126+	<u>550</u>	<u>22,860</u>	<u>42</u>
		1201	102,330	85
<u>Concrete</u>				
	1 - 25	90	18,973	210
	26 - 50	110	26,752	243
	51 -125	260	19,012	73
	126+	<u>0</u>	<u>0</u>	<u>0</u>
		460	64,737	141
<u>Gravel</u>				
	1 - 25	0	0	0
	26 - 50	100	2,905	29
	51 -125	125	8,153	65
	126+	<u>500</u>	<u>300</u>	<u>1</u>
		725	11,358	95

*Total use after normalization adjustment to compensate for multiple interview sites.

TABLE 5
Summary of Field Questionnaire
Use Estimate Figures

1.	Sample Count (unit of measure is parties) (mean persons per party is 2.86)	2,959
2.	Sample count - converted to persons	8,462
3.	Visitor day estimate for sample sites	296,300*
4.	Visitor day estimate for all GREAT III Recreation Sites	448,400*
5.	Pool and Open Estimates	
	Pool 24: 51,800	
	Pool 25: 99,100	
	Pool 26 196,900	
	Open: 100,600	
6.	Activity day estimate for all GREAT III Recreation Sites	1,214,200**

+ See Table 6, page 29, for further breakdown.

* Rounded to the nearest 100

Note: These estimates do not include use of the Jefferson Expansion Memorial; the St. Louis water front; dispersed, non-site based recreation; or General non-stopping traffic. Ft. DeChartes, Ft. Kaskaskia, and Ft. Defiance are, however, included.

LATENT DEMAND ANALYSIS

Information about latent recreationists (within the general population) was drawn by a survey of the population-at-large surrounding the GREAT III reach of the Mississippi River. Telephone was chosen as the most appropriate technique to quickly and inexpensively canvass the general population. Ten percent of the telephone sample was chosen from those who participated in on-site interviews.

Sampling Procedure

The service area for this survey was defined by telephone district boundaries for communities along the GREAT III reach of the Mississippi. These boundary lines bear no relation to country lines, city limits, or other civil jurisdictions. In addition, the districts do not necessarily represent any geographically defined limits, and districts may even overlap. Thus, it was not possible to define a telephone survey service area directly in relation to distance from recreation sites or from the Mississippi River. Thus, a service area was selected based upon communities listed in telephone books in districts covering both the Illinois and Missouri counties adjacent to the GREAT III reach. A complete list of communities is included in Appendix E, page E-1.

Initially, it was estimated that the telephone survey area would include coverage of the area in which 90% of the on-site survey interviewees resided. Because the telephone and on-site surveys were conducted simultaneously, the precise distance in which 90% of the on-site interviewees resided was not available. Afterward, data from the on-site survey indicated a 50 mile radius would have been a closer approximation. Thus, the telephone survey area actually covered an area in which less than 90% of users resided. This does not diminish the results of the survey, since it was a sample of the general population. The survey was simply drawn from a smaller geographic base than final results, if available beforehand, would have dictated. Phone calls were initiated in mid-1981 and completed January 1982.

After unexpectedly consistent results were shown by pilot studies in July, 1981, the size of the telephone survey was reduced to 4353 interviews. The pilot studies indicated significant consistency in telephone interviews similar to that of on-site interviews being conducted at the time. Phone calls continued through the fall and ended in January 1982.

Interview Process

A questionnaire was developed for use in the telephone survey to standardize and control data collection. This questionnaire (see Appendix C, page C-5) was comprised of three major components:

1. Identifier Data
 - a. Area Code
 - b. Telephone Number
 - c. Date of Interview
 - d. Agreement/Refusal to be Interviewed

2. Participation (and Latent Demand) Data
 - a. Use (or failure to use) during past 12 months
 - b. Use (or failure to use) during past 4 years
 - c. Activity -- specific utilization by recreationists
 - d. Anticipated change in use patterns
 - e. Rationale for projected change in use patterns
3. Qualitative Information
 - a. Recreation facilities or improvements desired by respondents
 - b. Conditions which could be changed to increase recreation use of the river
 - c. Listing of favorite outdoor recreation areas

Only adults were interviewed, based on the assumption that adults would be more likely to understand the questions and could serve as a more accurate surrogate of the household. Interviews were typically concluded within three minutes.

Survey identification numbers, interviewer name, date, and telephone number called were all entered on the form prior to each telephone interview (see Appendix C, page C-5). Second, the prospective respondent was called and asked to participate in the study. If respondents refused the interview, the conversation was terminated. These individuals were counted as Non-Respondents. Of all telephone calls made 21.0% (915 calls) resulted in refusal to be interviewed.

Persons who agreed to the telephone interview were asked if they had participated in river recreation during the past 12 months. If not, respondents were asked if they had used the river at some time during the past four years. Negative responses to both questions labelled a respondent as a "Non-User" and the activity questions were not asked. Those who participated during the past 12 months were asked to indicate which recreation activity categories described their use of the river. Recreationists could indicate activity in as many as 40 specific categories read to them over the phone. An "Other" category was included for completeness.

Once recreation activities were entered, respondents were asked to indicate whether their use during the next year would be "less", "more", or the "same". Those answering "less" or "more" were asked to specify the rationale for their answer.

Next, interviewees were asked two interrelated questions. First, a question was asked regarding the respondent's desire to see additional recreation facilities or improvements on the Mississippi River. Second, suggested conditions or circumstances which could be altered to increase recreation use were sought. Since both questions were open-ended, the respondents were free to make a wide variety of responses which were not influenced by interviewers. This pair of questions was included in order to cover both facility and non-facility related suggestions.

Finally, individuals were asked to identify two or three favorite outdoor recreation areas regardless of proximity to the Mississippi. As another

open-ended question, its purpose was to indicate the most popular recreation sites used by the general sample population as an alternative to the Mississippi River. The list of most popular recreation areas is included in Appendix E, page E-6.

USE ESTIMATES FROM TELEPHONE SURVEY

This section describes the procedure used to derive a use estimate for the GREAT III reach of the Upper Mississippi River. This use estimate was generated from a telephone sample of regional households. 4,030 households were sampled from the general population.¹ Working with the phone companies, it was possible to match 58% of the surveyed phone exchanges (2,345) with the respective total residential phones within each exchange. Remaining telephone companies refused to divulge the total residential exchanges in their respective territories, so a survey conversion was needed to estimate total households represented by an exchange. The calculation follows:

$$\frac{\text{Total Exchanges}}{\text{Surveyed Exchanges}} = \text{Survey Conversion}$$
$$\frac{436,170}{2,345} = 186$$

Thus each phoned exchange represents 186 households. This conversion factor was applied to the 4,030 phone surveys. Since 826 households of 4,030 (20.5%) reported using the Mississippi River during 1981, this represents an estimate of 153,636 households using the river based on the phone sample. Since only 81.9% of the on-site interviewees lived within 50 miles of the site of interview, an upward adjustment of the estimate was necessary. The adjustment factor was 1.22 (the quotient of 1.00 ÷ .819). An estimate of 187,435 households was then derived.

The on-site survey based estimate had an estimated number of parties being 156,783.² Since there was no indicator of party size per household from the phone survey, the on-site mean party size of 2.86 was used to convert "households" to an estimate of visitor days. This provides a population based visitor estimation of 536,064 (rounded to 536,100). This compares with the on-site estimate of 448,400, representing a between survey relative efficiency of .84 when expressed:

$$\frac{\text{On-Site Visitor Day Estimate}}{\text{Phone Survey Visitor Day Estimate}}$$

Thus the use estimates made from the on-site survey compares quite favorably with the independent use estimate from the telephone survey. A perfect match of estimates would result in a ratio of 1.00.

¹This is excluding phone surveys conducted on visitors selected from the 1981 summer field survey. This exclusion was necessary to eliminate an over-estimation bias which would result from including households with a known visitor/participation pattern.

²Party estimate is based on:

$$\frac{\text{Total Visitor Days}}{\text{Average Party Size}} = \text{Total Party Estimate} \quad \frac{448,400}{2.86} = 156,783$$

CALCULATION OF ERROR ESTIMATES AND CONFIDENCE INTERVALS

An estimate as a single number means very little. While point estimates are valuable, they do not provide a measure of dependability or accuracy. Thus, estimates should be examined in conjunction with their relative error. Since every estimated value has error attached, a more appropriate presentation of an estimate is the confidence interval: The upper and lower limits of the estimate for a given probability. A five-percent confidence interval was selected for this study. Thus, there will be a 5 in 100 chance that the estimate will fall outside the projected confidence interval. Confidence intervals and error terms have been calculated for both the on-site and telephone survey estimates of visitation described below.

On-Site Survey

The confidence interval (CI) was calculated from the following statistical formula:

$$CI = \Sigma x \pm \frac{S\bar{m}}{\bar{x}} ; \text{ where}$$

x = Total Visitor Days (448,400)

\bar{x} = Mean Visitor Days per Site (4,675)

$S\bar{m}$ = Mean Error Estimate (453 or 9.3%)

Thus, the Confidence Interval is 406,700 to 490,100 Visitor Days.

Other relevant measure of the distribution include:

Range 100 - 25,900

Standard Error: 4,396

Telephone Survey

In contrast to the on-site survey where all respondents were recreationists, the telephone survey estimate is based on properties of a population responding Yes or No to questions regarding recreation visitation. Thus, calculations are somewhat different based on proportionate measures.

The confidence interval (CI) for the telephone survey visitor-day estimate was calculated from the following equation:

$$CI = P_y \pm 1.96 \sigma_p ; \text{ where}$$

P_y = Proportion of population responding Yes
to river recreation visitation (20.5%)

1.96 = Constant for 5% interval

σ_p = Standard Error Estimate of the Popula-
tion (.63)

N = 4030 Total Respondents

It should be noted that:

$$\sigma_p = \sqrt{\frac{P_y(1-P_y)}{N}} = .63$$

Thus, the confidence intervals are computed as:

CI_1 = 19.26 to 21.74 (Proportion of Yes Responses)

CI_2 = 776 to 877 (Number of Responses)

CI_3 = 144,336 to 163,122 (After Survey Conversion)

CI_4 = 176,090 to 199,008 (After 1.22 Expansion Factor)

CI_5 = 503,617 to 569,162 (Based on Party Size 2.86 Conversion)

Therefore, the rounded confidence interval for total visitor-days on GREAT III was from a lower limit of 503,600 to an upper limit of 569,200 based upon the telephone survey.

PROJECTIONS OF FUTURE USE

In developing plans to meet future recreation demands, it is recommended that plans be developed to accommodate the highest reasonable activity estimates. For the purposes of projecting future use in this study the mean of the upper limits of the 95% confidence intervals of the on-site and telephone visitor-day estimates was used at the 1981 baseline total use figure. Using this as the benchmark (529,600 visitor-days) gives the best assurance that aggregate demands can be met in the future. To use lower estimates could put resource managers at-risk of underestimating demands and being unable to satisfy user needs in the years to come.

For the first option, the assumption was made that recreation use would parallel population change in the future. Projections for year 1990 and 2000 recreation use were keyed to population projections furnished by the Corps of Engineers. These projections are shown in the Appendix F. The proportionate change in population was simply extended to recreation visitation.

Caution should be exercised in using this projection. First there is no foundation to clearly support a linear relationship between regional populations and regional outdoor recreation activity. However, the method is commonly used in studies of this type for lack of better alternatives (Becker, 1978).

During the regional telephone survey, respondents were asked whether they intended to alter their recreation plans in the next twelve months. Thus a second set of projections was prepared on the assumption that individuals will indeed follow through with their intentions. Further, it does not explicitly consider any improvement of river conditions or facilities. This results in a net annual growth in recreation activity of 2.6% as described on page 45 of this report. The increased activity based upon the 2.6% growth was then adjusted upward to recognize the increased population bases of 1990 and 2000.

Finally, an option was included to allow an accounting of latent demands. According to the Latent Demand Analysis certain specified improvements to the river will generate additional usage. To accommodate these upward shifts in demand, impact multipliers were calculated to allow the user to adjust projections upward by fixed proportions if changes in river conditions or improvements are incorporated on the GREAT III reach. Impact multipliers are quantitative measures which are used to adjust the expected amount of future recreation activity for selected latent demand categories through simple multiplication. Resource managers who wish to evaluate impacts associated with strategies that would capture latent demands can use these multipliers to adjust the projections presented under Option I or Option II above. Example use of these impact multipliers is shown in the section entitled Findings - Option III: Accommodation of Latent Demands.

SURFEIT/ DEFICIT ANALYSIS

The purpose of the Surfeit-Deficit Analysis is to determine the need or surplus of recreation lands required to meet 1981 and projected year 1990 and 2000 participation in river recreation activities. It is designed to assist the GREAT III Recreation Work Group, Corps of Engineers, other public agencies and private entities in the evaluation of whether an adequate amount of land is set aside for outdoor recreation, or whether additional lands should be acquired.

The study was not intended to provide specific facility requirements (e.g., number of picnic tables, boat ramps, etc.). Thus, the analysis does not intrude upon specific facility and site prerogatives of various agencies and private recreation entities which must develop individual sites in the manner deemed most appropriate. As indicated below, the analysis can be extended to assist in estimating facility requirements, but such estimates are beyond the scope of this study.

In addition, previous portions of this study identified improvements suggested by recreationists and conditions which would increase recreation use. Results show that there is some public concern that recreation lands have shortcomings related to accessibility. Both on-site surveys and the regional telephone survey generated suggestions for "More" facilities. However, improved access may involve improvements of existing lands rather than acquisition of additional acreage. In planning for the future, recreation resource managers must consider both alternatives, land acquisition and the improvement of existing recreation lands, when evaluating land needs.

Land Adequacy Index

To determine lands needed to meet recreation demands, it was necessary to construct a measure which incorporated a land area measure (acres) and demand factors (visitor-days). The method chosen for the surfeit-deficit analysis was to construct a Land Adequacy Index (LAI) for the entire GREAT III reach, Pools 24, 25, 26 and the Open Segment. This method relates recreation demand measures to the supply of recreation lands through the following formula:

$$\text{LAI} = \frac{\text{TOTAL ANNUAL PARTICIPATION IN VISITOR DAYS}}{\text{TOTAL ACRES IN RECREATION USE}}$$

This measure indicates the level of intensity at which recreation lands are being used. A high number of visitor-days per acre (a high LAI) shows that recreation land in the area is more heavily used than areas where the visitor-days per acre (and LAI) are low. Thus, intensity of use among Pools, the Open Segment, and the entire GREAT III reach can be compared. For example, if the LAI was lower on Pool 24 than on Pool 25, the recreation land on Pool 24 is serving relatively fewer visitors than the land on Pool 25.

In addition, changes within an area can be projected for future years. For example, if the LAI is projected to double by the year 2000 on a selected pool, the implication is that intensity of land use (visitor-days per acre) will double. Twice as much visitation would be expected on the pool. Thus,

the LAI serves as a measure which allows comparison of use intensity among river reaches or for projection of changes in use intensity within a segment of the river at different points in time.

In order to convert the LAI into a measure of surplus or deficit land acreage, it was necessary to establish a benchmark to represent a desired level or standard LAI. There is no accepted national standard available from recreation literature that is directly applicable to river recreation lands or to the GREAT III geographic area. In addition, findings from the on-site survey and telephone survey provided few suggestions for improvements that were related to land needs or over-intensive use (see Findings: Current Use Assessment, page 27, and Improvements Suggested, page 44, for analysis of suggested improvements).

Thus, the benchmark established for determination of the land surplus or deficit was the aggregate LAI of 12.30 visitor-days per acre which represents average intensity of use on the GREAT III reach as measured from the findings of this study. Recreation land requirements can then be estimated by the following equations:

- 1) Recreation Land Requirements =
$$\frac{\text{Visitor-Days of Use}}{12.30 \text{ Visitor-Days per Acre}}$$
- 2) Surplus or Deficit = Existing Acreage - Land Requirements.

If existing acreage exceeds requirements, a surplus results. On the contrary, if existing acres are exceeded by the required acreage, then there is a deficit of recreation lands.

It is necessary that the LAI and land surplus or deficit estimates be applied only in conjunction with other pertinent factors regarding recreation trends, funding, physical features, site characteristics, and design limitations relevant to any individual sites or facilities. The measures are aggregate figures representing large geographic areas and cannot be used to indicate that any particular site or facility is either in excess of needs or requires more land.

There are several distinct advantages to the LAI method. First, it satisfies requirements to assist in land acquisition and management decisions by providing a measure of recreation land needs, and it allows comparison of one area to another. Second, it is tied directly to the Recreation Area and Facility Inventory which was used for acreage data in the supply portion of the equation. Thus, changes in the supply as acquisition or deletion of land occurs can be computed directly into the formula by simply adding or subtracting changes in acreage to the lower portion of the ratio.

It should be noted that the Recreation Area and Facility Inventory does not allow disaggregation of total acreage into specific amounts for individual activities. Because of the multiple (perhaps simultaneous) uses of an indi-

vidual recreation area, it is impractical to divide a site into acres dedicated specifically to activity functions. For example, a 50 acre park cannot be divided into 5 acres solely for picnicking, 5 acres for camping, 20 acres for fishing, and 20 acres for buffer or undeveloped. Compatibility with the Recreation Area and Facility Inventory and its supply data was essential in the selection of the method.

Visitor-Days was selected for the recreation participation measure because it does not "double-count" land use demands. Therefore, the index is keyed to the number of visitors and not the specific activities in which they are engaged. Use of activity-specific measures would exaggerate the index and subsequent land requirements.

In addition, the Index is linked with demand estimates generated as a part of this report. The upper portion of the equation considers current or projected uses of the respective land areas. Increases in recreation use due to population change or capture of latent demands can also be computed and reflected directly in the equation.

Extension of the Analysis for Facility Requirements

A multiplicity of standards for facility requirements are available and data from this report can be used in conjunction with such standards to generate facility-specific, quantitative estimates of needs for such things as picnic tables, boat ramps, campsites, and others. Such standards are geared toward one of two general purposes: either estimating the amount of facilities needed or the site requirements for a particular use.

The former may be useful when applied to the activity day forecasts. As an example, if the standard of one picnic table per 400 annual activity days was selected for use, then 243 tables would be needed to accommodate the 97,300 activity days of 1981 on the GREAT III reach. Extreme caution must be exercised in the use of such standards since they fail to consider geographic distribution and accessibility, site characteristics, and design limitations. However, standards applied to demand data from this study may be useful for planning purposes even though not within the scope of this study.

Another technique which could be applied for facility analysis is Relative Adequacy Indicator. This is the methodology outlined in Outdoor Recreation in Illinois, the Statewide Comprehensive Outdoor Recreation Plan, published in 1978 by the Illinois Department of Conservation. In addition it was used in the GREAT II Recreation Work Group Appendix to determine the ranking of river pools on the bases of supply and demand for facility development. Pools were ranked according to their ability to provide recreation services based on the following formula:

Relative Adequacy Indicator Equals Annual Participation in Activity Days
Per Pool Divided by Recreation Supply Per Pool.

According to the report, a pool with a low Relative Adequacy Indicator ranking for a specific activity would be providing a better recreational service in comparison to a pool with higher ranking. Conversely, pools with high Relative Adequacy Indicator values in a given activity indicate that a pool is providing recreational services of a lesser degree. The measure does not attempt to judge the quality of facilities or services provided in this ranking. It must be remembered that each pool may have unique factors that could enhance or adversely affect the activities taking place there.

The Land Adequacy Index used in the surfeit-deficit analysis is analogous to the RAI except that the RAI addresses facility needs instead of land needs. The same limitations discussed above apply in both analyses.

FINDINGS

FINDINGS

The findings reported below are the results of four phases of the "GREAT III Recreation and Natural Area Needs Assessment":

- a. Current Use Assessment, 1981
- b. Latent Demand Analysis
- c. Projections of Future Use
- d. Surfeit/Deficit of Recreation Lands

Where additional information may be pertinent, appropriate appendatory material is cited.

CURRENT USE ASSESSMENT

Based upon on-site interviews with recreationists, two estimates of recreation activity were developed: Visitor-Days and Activity-Days. A visitor-day refers to the presence of a recreationist engaged in any recreation activities for any portion of a day. For example, a recreationist visiting a park on a given day would generate one visitor-day regardless of how many activities were observed. An activity-day, on the other hand, is any portion of a day in which a person participates in a recreation activity. As an example, a recreationist who engaged in picnicking and bank fishing on a given day generates two activity-days. Thus, activity-days are a measure of participation patterns for various types of recreation, while visitor-days show the number of visitors regardless of activity.

Total visitor-days on GREAT III in 1981 were estimated to be 448,400, based upon the on-site sample survey. Activity-days amounted to 1,214,200 in 1981. Table 6 shows a complete estimate of both visitor-days and activity-days on GREAT III, Pools 24, 25, 26 and the Open Segment. Results indicate the greatest activity is found on Pool 26 with 575,000 activity-days followed by Pool 25 with 288,500 activity-days, and the Open Segment with 196,000 activity-days. An analysis of activity patterns within each pool and Open Segment is presented in the following section.

The Jefferson National Expansion Memorial was not included in survey sites. Visitation to this site is so great that it would have skewed survey results. Appendix D contains a complete explanation of findings regarding this site.

TABLE 6

1981 ESTIMATE OF ACTIVITY DAYS
BY RIVER LOCATION FOR THE GREAT III REACH
OF THE UPPER MISSISSIPPI RIVER

Activity	Pool or Segment				Total
	24	25	26	Open	
Cottage Use	5100	9200	5800	1000	21,100
Hard Top Camper	1900	3400	5300	4200	14,800
Tent Camping	1000	1900	6100	2200	11,200
Other Camping	--	--	500	--	500*
Boating					
Canoeing	700	700	600	200	2,200
Fishing Boat	10500	17100	14400	6900	48,900
Sailboat	100	200	4300	1200	5,800
Runabout	9500	18100	63900	12500	104,000
Pontoon Boat	600	1100	1200	1100	4,000
Cabin Cruiser	1200	3000	26400	4400	35,000
Tour Boat	200	200	400	106	900*
Houseboat	500	900	11600	2700	15,700
Other Boating	500	900	5200	1900	8,500
Loafing/Relaxing	24000	45100	75800	32200	177,100
Bank Fishing	12000	22900	24300	9000	68,200
Boat Fishing	12100	24000	31900	10000	78,000
Set Line Fishing	1000	2000	1900	900	5,800
Picnicking	9600	17800	49900	20000	97,300
Water Skiing	8700	16000	47600	8400	80,700
Swimming	6900	13000	41700	5700	67,300
Caving	--	--	1800	--	1,800*
Hunting General	--	--	500	400	900*
Waterfowl Hunting	6100	12000	1900	600	20,600
Small Game Hunting	200	300	2000	200	2,700
Deer Hunting	600	900	1400	1100	4,000
Turkey Hunting	200	600	600	--	1,400*
Target Trap Shooting	200	300	900	--	1,400*
Day Hiking	1400	2800	7900	3600	15,700
Overnight Hiking	100	200	200	400	900*
Viewing the River	26100	49200	75900	50100	201,300

TABLE 6
(Cont'd)

1981 ESTIMATE OF ACTIVITY DAYS
BY RIVER LOCATION FOR THE GREAT III REACH
OF THE UPPER MISSISSIPPI RIVER

Activity	Pool or Segment				Total
	24	25	26	Open	
Four-Wheel Driving	400	800	1700	200	3,100
Motor Cycling	1300	2400	1800	2100	7,600
Snowmobiling	200	300	400	--	900*
Bicycling	600	1100	8700	800	11,200
Trapping	--	100	--	--	100*
Wildlife Viewing	6700	11300	13500	3500	35,000
Rapelling	100	200	1100	--	1,400*
Sunbathing	4000	7700	28300	3100	43,100
Horseback Riding	100	200	1100	--	1,400*
Cross Country Skiing	--	--	100	--	100*
Other	300	600	6400	5300	12,600
Grand Totals	154,700	288,500	575,000	196,000	1,214,200
# Visitor Days	51,800	99,100	196,900	100,600	448,400
% Visitor Days	11.5	22.1	43.9	22.5	100
% Activity Days	12.8	23.8	47.3	16.1	100

* Low Count Activity Days are Susceptible to Extrapolation Error Due Few Sample Respondents.

POOL 24

Pool 24 is the section of the Mississippi from Lock and Dam 22 at River Mile 301.3 to Lock and Dam 24 at River Mile 273.4. A total of 490 interviews were conducted at 9 recreation sites on this pool. Analysis of these responses and comparisons to other pools is presented below. Complete tabular summaries of each pool and the open segment of the study area are shown in Appendix D of this report.

Age-Sex-Race

The age distribution of respondents on this pool was concentrated in the 36-55 year age group (39.1%), but the 17-35 age group (32.2%) and 56 and older category (28.4%) were also very important. This pool had the highest percentage of respondents in the 56 and older age group and the lowest percentage in the 17-35 age group in comparison to the other study areas.

Respondents to the survey in Pool 24 were predominantly male (81.4%). This reflects only the sex of the interviewee and not the entire party which he represented. Although only 18.4% of the total interviewees sampled on this pool were females, this cannot be interpreted to mean few females were present as recreationists.

Of the total samples on this pool, 96.3% were White, with the remainder simply classified as Non-White. The percentage of interviewees which are Non-White appears to be lower than the population of the area as a whole, but the percentages cited represent actual findings of the survey. It is unknown why more Non-Whites were not present. This result was quite similar in other pools.

Party Size

The most frequent size of recreation parties was two persons, accounting for 36.7% of those parties surveyed. Single-person parties accounted for 22.9% of the total and were the next most frequent size. Three-person and four-person parties accounted for 16.3% and 12.5% of the total respectively, important contributors to total usage. Groups of five or more were also significant and represented 11.6% of the parties sampled. It should be noted that the party size observed in Pool 24 was generally smaller than that found on other pools.

Visitation Characteristics

Recreationists were seldom visiting the river for the first time ever. Only 6.1% of those interviewed on Pool 24 were making their initial visit. Most respondents visit the Mississippi often. Over three-fourths (75.3%) indicated that they normally visited the river over 6 times per year, and 16.9% added that their visits were at least weekly. One time per year visitors accounted for 9.8% of the respondents and do represent an important factor in recreation use.

Over half the respondents indicated that their stay at the recreation site would last less than 4 hours (51.2%). The bulk of the other recreationists stated that their length of stay would be one-half to one day. Nearly one-

third of the respondents fell into this category. Consequently a cumulative total of 84.0% utilized the sample recreation sites for less than one day. Those who stayed 2 days and nights (including weekenders) accounted for another 7.0% of the total.

Vehicles

By far the most frequent mode of transportation to the recreation site was car, truck, or van. This response accounted for 88.6% of the total. Only 3.8% arrived by camper and 2.5% by boat. Multiple vehicle parties represented 9.2% of the parties, and no more than 2.0% were parties of 3 or more vehicles.

Distance from Home

The majority of users on Pool 24 are local residents within 25 miles from home (60.5%). Another 10.7% live between 26-50 miles away, and 21.5% reside in areas 51-100 miles distant. Only 7.4% of those surveyed on this pool resided over 100 miles from the recreation site. More respondents fall into the 0-25 mile range on this pool than on any other pool.

Activities at Recreation Sites on Pool 24

Activities in which recreationists participated were counted in 41 separate activity classifications. It should be noted that eight activities are common to the ten leading activities for each pool and the Open Segment. This finding showed remarkable consistency from one area to the next. Shown below are the top ten ranking activities found in the Pool 24 survey:

POOL 24: MOST FREQUENT ACTIVITIES

<u>Rank</u>	<u>Activity</u>	<u>Percent**</u>
1	* Viewing River	54.1%
2	* Loafing/Relaxing	41.5%
3	* Bank Fishing	19.2%
4	* Picnicking	14.7%
5	* Runabout	14.5%
6	* Boat Fishing	14.2%
7	Wildlife Viewing	13.7%
8	* Water Skiing	11.0%
9	* Swimming	7.1%
10	Cabin Cruiser	6.3%

* Common activities among all pools and open segment.

** Percentages will not total 100% because of multiple uses by recreationists.

Most frequently identified of all activities was simply Viewing the River, while the second most frequent was Loafing/Relaxing. Perhaps one explanation for the high ranking is that these activities are part of all river-related recreation. Loafing/Relaxing is an important element of all passive recreation. Viewing the River is very important at most recreation sites on the Mississippi.

Fishing was of great importance in Pool 24. Bank Fishing and Boat Fishing both were high ranking activities (rank number 3 and 6 respectively) and attest to the significance of fishing activities. Set line fishing, on the other hand, was extremely limited among respondents.

Another segment of activities of great importance was boating. Fishing boats (6.1%) and runabouts were the most substantial boating activities, along with Cabin Cruisers (6.3%). Otherwise boating activities were limited. Sailboats, Pontoon Boats, Tour Boats, Houseboats, and Other Boats accounted for less than 3% of the recreation parties responses in single activity category.

Picnicking ranked fourth among activities on this pool. One reason picnicking ranks so high may be that picnicking is possible as a complementary recreation activity. Those participating in a boating or fishing activity may easily have a picnic during their visit.

Wildlife Viewing was very important on Pool 24, since 13.7% of the recreationists interviewed were engaged in such activity. Compared to other pools, Wildlife Viewing was much more frequent on Pool 24.

Following this activity, Water Skiing and Swimming were ranked eighth and ninth. Water skiing was an activity of 11.0% of the recreationists while Swimming was listed by 7.1%. It is interesting to note that on Pool 24 and all other pools in the overall area, these two activities ranked in the same numerical succession.

Only two other major activities were indicated on this pool: Sunbathing (5.5%) and Waterfowl Hunting (5.5%). No remaining activities were identified by more than 5% of the recreationists participating in activities on the river.

User-Suggested Improvements

As part of the interview, recreationists on Pool 24 were asked if there were problems with recreation facilities or improvements they wished to see on the Mississippi River. This was an open-ended question with no prearranged set of answers. Interviewers were trained not to lead the respondents, even though respondents may or may not know of things that would improve river recreation. This question was asked in order to register the ideas and feelings of the users. This will serve as an aid to area recreation managers as they make decisions in the future.

The leading suggestions of recreationists on Pool 24 are shown below.

POOL 24: MOST FREQUENT USER SUGGESTIONS

Rank	Suggestion	Percent	Number
1	More Toilet Facilities	5.9%	29
2	More Public Access	4.1%	20
3	Pickup Trash	3.3%	16
4	More Sand Bars	3.1%	15
5	Improve Boat Ramps	3.1%	15
6	Improve Water Quality	2.2%	11
7	More Boat Ramps	1.6%	8
8	More Campgrounds	1.6%	8
9	More Places to Eat	1.6%	8
10	More Marinas	1.6%	8

Many of these suggested improvements center on increased access to the river. More Public Access was ranked high in the entire study area, but on Pool 24 is complemented with a perceived need also for more Sandbars, Boat Ramps, Marinas, and Campgrounds. All of these suggestions deal with the perception that additions to these components of recreation supply would be beneficial.

It should be noted that more Control of Water Levels was suggested by only 1.2% of the respondents on Pool 24. This is substantially less than the frequency of response on the downstream study areas.

It is important to realize that 60.8% of those interviewed chose not to comment at all on suggested improvements. These individuals either did not feel strongly enough to comment or could think of no improvements to suggest.

Throughout the analysis of User-Suggested Improvements, the ten most frequently cited improvements per pool or open segment are analyzed in order to allow cross-comparison of geographic areas. While some responses may seem low, it must be remembered that this was the result of an open-ended question with no preconceived list of problems from which the respondent could select issues. Responses to such open-ended questions are typically much lower (Berdie and Anderson). This does not mean that users who did not respond either agree or disagree with the suggestions made. The purpose of the question during the survey was to provide some insights into user-perceived improvements on an area by area basis.

POOL 25

Pool 25 extends from Lock and Dam 24 at River Mile 273.4 to Lock and Dam 25 at River mile 241.5. A total of 659 interviews were conducted at eleven sites on this Pool. Analysis of the respondent characteristics, activities, and user-suggested improvements is presented below. Detailed tabular data in support of this analysis is shown in Appendix D.

Age-Sex-Race

The vast majority of respondents on Pool 25 were male (85.4%). This represented that greatest percentage of male respondents in any pool or segment. Again, however, it should be noted that this statistic is only indicative of the person interviewed and does not identify the total population of users.

The age distribution of Pool 25 recreationists was divided between the 17-35 years age group (36.9%) and the 36-55 age group (43.4%). Less than 20 percent of those interviewed were 56 or older. Only 4.5% of respondents were Non-White, a figure generally consistent with other portions of the study area.

Party Size

The size of recreation parties was typically two-persons (37.2%), but single-person (17.6%), three person (17.9%), four person (17.0%), and five or more (14.8%) were also frequently observed.

Visitation Characteristics

As in other pools and the Open Segment, recreationists were seldom visiting a Pool 25 recreation site for the first time ever. Indeed only 5.0% indicated this was a first visit. This was the lowest response of any area. In comparison, 81.2% of the respondents stated that they normally visited the river more than 6 times per year. Of the remainder, 9.3% visited from 3-6 times per year.

Pool 25 was the site of somewhat longer stays than in other areas. The most frequent stays were 0-4 hours (40.1%) and one-half to one day (36.3%). Those who visited two days and nights (weekenders) were relatively more frequent in this pool, accounting for 11.3% of recreationists.

Vehicles

Most frequently, recreation parties arrived at their destinations on Pool 25 by car, truck, or van. Only 10.3% arrived through some other mode. Most parties (88.2%) were single vehicle parties, and another 6.7% were two vehicle parties. Parties of 3 or more vehicles accounted for only 5.1% of the respondents.

Distance from Home

The largest percentage of recreationists lived within 25 miles of the sites surveyed. On Pool 25, 40.7% fit this category, while on all other areas the percentage from 25 miles or less ranged from 58.7% to 60.5%. Thus, Pool 25 is somewhat different in this respect. Approximately one-third (33.1%) resided 26-50 miles from the site, and 23.3% resided 51-100 miles away. Unlike Pool 24, only 3.0% of the respondents travelled beyond 100 miles to reach the recreation site.

Activities at River Recreation Sites on Pool 25

As in the case of every other pool and the Open Segment, the top ranking activities on Pool 25 were Viewing the River and Loafing/Relaxing. The ten leading activities on Pool 25 are shown below in rank order with the percentage of respondents who indicated presence of the activity. It is interesting to note that nine of the ten activities listed are common to Pool 24, even though the rankings are somewhat different.

POOL 25: MOST FREQUENT ACTIVITIES

Rank	Activity	Percent**
1	* Viewing River	46.6%
2	* Loafing/Relaxing	44.5%
3	* Boat Fishing	24.3%
4	* Bank Fishing	22.7%
5	Fishing Boat	22.3%
6	* Picnicking	19.0%
7	* Runabout	18.3%
8	* Water Skiing	16.8%
9	* Swimming	13.4%
10	Waterfowl Hunting	12.2%

* Common activities among all pools and Open Segment.

** Percentages will not total 100% because of multiple uses by recreationists.

Fishing is obviously a predominant activity in this pool according to this table. Just less than one-fourth of the respondents were engaged in each of the categories of Boat Fishing and Bank Fishing. In addition, the number 5 ranking of Fishing Boat, where boating is the prime activity, and the number 7 ranking Runabout are both indicative of the importance of boating as well.

Picnicking was a use indicated by 19.0% of the recreationists similar to results from other pools. Likewise, Water Skiing and Swimming again ranked in successive order and paralleled these uses in other pools. Pool 25 is unique in having Waterfowl Hunting fall into the ten leading activities, and 12.2% indicated participation in this activity. On no other portion of the study area did this occur in more than 5.5% of recreation parties.

The only other activities in which more than 5% of Pool 25 recreationists participated were: Cottage Uses (10.4%), Wildlife Viewing (11.1%), and

Sunbathing (7.7%). Cottage Uses refers to leased cabin sites along the river used for recreational purposes.

User Suggested Improvements

More Control of Water Levels was the most important need perceived by Pool 25 recreationists. Eight-eight respondents (13.4% of the total) indicated that water level control was a problem. This was more than double the second most frequent problem. Control of Water Levels involved recreationists concerns with fluctuation in levels -- that water might be extremely low in one visit and high during the next visit. According to the St. Louis District Corps of Engineers, Water Control Management Section, Pool 25 water levels are more sensitive to changes in the flow of the river. This is apparently due to physical features of Pool 25.

The ten most frequent suggestions on Pool 25 are ranked below with the percent of respondents making the suggestion.

POOL 25: MOST FREQUENT USER SUGGESTIONS

<u>Rank</u>	<u>Improvement</u>	<u>Percent</u>	<u>Number</u>
1	More Control of Water Level	13.4%	88
2	More Public Access	6.4%	42
3	More Campgrounds	3.5%	23
4	Improve Boat Ramps	3.2%	21
5	More Dredging	2.4%	16
6	More Toilet Facilities	2.3%	15
7	More Boat Ramps	2.3%	15
8	More Marinas	1.8%	12
9	Pickup Trash	1.5%	10
10	Raise Water Levels	1.4%	9

More Public Access was an important suggestion once again, and was accompanied by related suggestions for More Campgrounds, More Boat Ramps, and More Marinas. Improved Boat ramps (3.2%), More Dredging (2.4%), and More Toilet Facilities (2.3%) were also among the most frequently cited improvements.

Those who had no suggestions for improvements accounted for 52.0% of the respondents on Pool 25, the lowest "No Comment" percentage of any area studied.

POOL 26

Pool 26 reaches from Lock and Dam 25 at River Mile 241.5 to Lock and Dam 26 at River Mile 202.9. A total of 21 sites were sampled on this segment, resulting in 1259 interviews. Analysis of the results is presented below. Complete tabular summaries of each question addressed are included in Appendix D.

Age-Sex-Race

Respondents on Pool 26 were primarily male (76.9%); however, females accounted for a much higher percentage of the total (23.1%) than occurred on Pools 24 or 25. Again, this does not indicate anything relative to total use levels by females. It is merely that the interviews were primarily conducted with men.

Nearly half (47.4%) of the respondents were 17-35 years of age -- a younger population of users than was found on the upper pools. Another 37.5% fell into the 36-55 category, while only 15.1% were over 56 years of age. As on the other pools, Non-White accounted for a very small proportion of recreationists (3.3%).

Party Size

Pool 26 closely resembles the other pools and Open Segment with a most common party size of two persons (38.6%). The remaining parties were split among single-persons (15.9%), three-person (18.0%), four-person (16.9%), and parties of 5 or more (10.6%).

Visitation Characteristics

Few respondents were visiting for the first time ever (6.8%). Nearly three-fourths (73.7%) normally visited over six times per year, and approximately one-fourth (25.8%) visited at least weekly. This Pool has higher proportion of weekly or more frequent repeat users than any other pool or segment.

Length of stay on Pool 26 was quite similar to Pool 25. The most frequent response was a stay of 0-4 hours (41.4%), followed closely by a stay of one-half to one day (40.9%). The weekend users (two days and nights) were the next most frequent at 8.6%.

Vehicles

By far the most frequent mode of transportation to a recreation site was car, truck or van (89.3%). Boats were used by 4.1% of the respondents -- more than on Pool 24 or 25. Multiple vehicle parties were observed in 9.8% of the recreation parties.

Distance from Home

On Pool 26, 58.7% of recreationists surveyed resided within 25 miles and another 33.3% lived within 26-50 miles. Thus, 92.0% of all those

surveyed on this pool were within 50 miles of home. Thus, the use of this pool is heavily concentrated in the local/regional area population. Only 8.0% travelled more than 100 miles to the recreation sites sampled.

Activities at Recreation Sites on Pool 26

As in every other pool or segment, the two leading recreational activities on Pool 26 were Viewing the River and Loafing/Relaxing. The percentages of users indicating these activities are shown below along with the other most frequent activities on Pool 26.

POOL 26: MOST FREQUENT ACTIVITIES

<u>Rank</u>	<u>Activity</u>	<u>Percent**</u>
1	* Viewing River	38.5%
2	* Loafing/Relaxing	37.0%
3	* Runabout	32.5%
4	* Picnicking	26.1%
5	* Water Skiing	24.7%
6	* Swimming	21.5%
7	* Boat Fishing	16.4%
8	Sunbathing	14.5%
9	Cabin Cruiser	12.9%
10	* Bank Fishing	11.9%

* Common among all pools and open segment activities.

** Percentages will not total 100% because of multiple uses by recreationists.

Pool 26 has a profile indicating more active recreation uses. While Viewing the River and Loafing/Relaxing were still the leading activities, they were not so dominant in Pool 26. More important than elsewhere were use of Runabouts, Water Skiing, and Swimming. Only on Pool 26 was Sunbathing ranked so high. Picnicking remained one of the most frequent uses.

Fishing was still a substantial activity. Boat Fishing (ranked seventh) was indicated by 16.4% of the recreationists, while Bank Fishing (ranked tenth) was an activity of 11.9%. Thus, these forms of fishing were frequent, even though not as important in relationship to other areas.

Cabin Cruiser use was observed more frequently on this pool than any other area studied. Here, 12.9% of recreationists were engaged in this activity.

Although not among the ten most frequent activities, the use of Houseboats (5.8%) was encountered more often on this pool than elsewhere. Fishing Boats were observed in 7.9% of the recreation parties. An activity ranked higher in the upper pools, Wildlife Viewing, appeared less frequently in Pool 26 (5.7%). Although no other single use was observed in more than 5% of the interviews, two activities were much more frequent than reported in Pools 24 or 25: Day Hiking (4.0%) and Bicycling (4.5%). This may be due to the use of the McAdams Parkway on Pool 26.

User-Suggested Improvements

Improvements suggested by Pool 26 users were most frequently geared to accessibility of recreation sites. The percentage who commented on problems or improvements are indicated below in order of frequency.

POOLS 26: MOST FREQUENT USER-SUGGESTED IMPROVEMENTS

<u>Rank</u>	<u>Improvement</u>	<u>Percentage</u>	<u>Number</u>
1	More Public Access	3.7%	46
2	Pickup Trash	3.1%	39
3	More Toilet Facilities	3.1%	39
4	More Boat Ramps	3.0%	38
5	More Places to Eat	2.7%	34
6	More Gas Stations	2.5%	31
7	More Sand Bars	2.3%	29
8	More Control of Water Levels	2.3%	29
9	Improve Water Quality	2.0%	25
10	More Dredging	1.8%	23

Along with More Public Access in general, other suggestions appeared that are companion to this item: More Boat Ramps (3.0%) and More Sand Bars (2.3%).

Although More Public Access was the most frequent problem cited, Pool 26 exhibited a much wider variety of responses. For example, no single suggestion is so predominant as the perceived need to control water levels in Pool 25.

Those who had no comment on this portion of the interview accounted for 59.3% of the respondents.

OPEN SEGMENT

The Open Segment is that portion of the Mississippi which extends from Lock and Dam 26 at River Mile 202.9 to the mouth of the Ohio River (River Mile 0.0). A total of 520 interviews at 15 sites were conducted along the Open Segment.

Age-Sex-Race

On this segment of the Mississippi River, recreationists interviewed reflected on age distribution nearly identical to that found in Pool 26. Approximately one-half (48.6%) of the respondents were in the 17-35 year age group, while the 36-55 age group accounted for 36.3%. The older population aged 56 or more comprised only 15.1% of the total.

Respondents were typically White (95.9%), and Non-White recreationists were rare (4.1%). This finding was similar to the three upper pools. The Open Segment was the site of the highest percentage of females interviewed (26.6%). Again, this implies nothing about female recreation participation, but rather that more interviewees were female.

Party Size

In this segment, the most frequent party size was two persons (35.4%) -- a result consistent throughout the study area. Parties of one-person (16.3%), three persons (17.5%), four persons (17.7%) and 5 or more (10.6%) were all important size categories, however.

Visitation Characteristics

The Open Segment respondents differed from the upper pools. While only 5.0% to 6.8% were visiting upstream sites for the first time ever, 9.0% of the respondents were visiting the Open Segment for the first time ever. While 63.9% indicated they normally visited six times or more per year, on the upper pools approximately 75% visited with this high frequency. Nearly 1 in 5 respondents (18.3%) normally visited only once per year.

In addition to less frequent participation in river recreation activities, recreationists were more often visiting a site for 4 hours or less. Nearly two-thirds (64.7%) indicated a stay of this length, very different from the range of 40.1% to 51.2% found in Pools 24, 25 and 26.

Vehicles

The most frequent mode of transportation to the recreation sites of the Open Segment was either car, truck, or van (83.4%). On this portion of the river 4.8% arrived by boat, but no other category exceeded 4 percent. Multiple vehicle parties were somewhat less frequent in this area, accounting for 6.5% of the parties. The bulk of the multiple vehicle parties were two-vehicle, which accounted for 4.8% of the total respondents.

Distance from Home

The majority of users in the Open Segment resided within 25 miles of the recreation site (58.8%) and another 19.6% travelled between 26-50 miles. Thus, the recreationists here were again dominated by local and regional residents. However, this portion of the study area is noteworthy in that 9.2% of the respondents travelled more than 250 miles to reach the recreation site. The range of frequencies upstream was from 1.5% to 3.3%. Clearly, the Open Segment draws from a wide geographic area. The reasons for this are not discernable from survey data since no questions were geared specifically to long-distance travellers. It is possible that the extreme range of the Open Segment, availability of complementary recreation sites, and distance from major population centers may all have some impact. In addition, distances between recreation sites are greater than on the upper pools, holding a potential for dispersed, local use that might be greater than that found on the upper pools.

Activities most frequently found on this segment are shown below with the percentage of respondents who indicated participation in each activity. The findings are quite similar to those in the remainder of the study area. Viewing the River and Loafing/Relaxing again are the most frequently reported activities.

OPEN SEGMENT: MOST FREQUENT ACTIVITIES

Rank	Activity	Percent**
1	*Viewing the River	45.1%
2	*Loafing/Relaxing	31.6%
3	*Picnicking	20.0%
4	*Runabout	12.1%
5	*Boat Fishing	10.6%
6	*Bank Fishing	9.0%
7	*Water Skiing	8.3%
8	*Swimming	6.9%
9	Fishing Boat	6.9%
10	Other	5.4%

* Items common to ten most frequent activities on each of the upper pools.

** Percentages will not total 100% because of multiple uses by recreationists.

Eight of the ten most frequent activities were common to the leading ten activities found in the other portions of the study area. A lower frequency cited Loafing/Relaxing as an activity on the Open Segment than elsewhere, but it remained the second most common response. One in five recreationists included picnicking in their activities, while fishing was again an important use. Boat Fishing was an activity of 10.6% of the respondents and Bank Fishing was found in 9.0% of the parties.

Uses not found among those listed above include, Hardtop Campers (4.8%), Day Hiking (3.5%), and use of Cabin Cruisers (3.5%). No other area had as frequent use of Hardtop Campers and only Pool 26 had as much Day Hiking activity. No other activity was observed at a level of 5% or more.

User-Suggested Improvements

Improvements suggested by respondents on the Open Segment are shown below in rank order of frequency. The issue of accessibility to recreation sites appears far less dominant on this portion of the river. More Public Access was ranked number 5 while it ranked second on Pools 24 and 25 and ranked first on Pool 26. The companion items of More Boat Ramps and More Marinas did appear, along with More Development of Campgrounds. Thus, accessibility is still an important concern, but less so than on the upper pools.

OPEN SEGMENT: MOST FREQUENT USER-SUGGESTED IMPROVEMENTS

<u>Rank</u>	<u>Improvement</u>	<u>Percent</u>	<u>Number</u>
1	Pickup Trash	4.4%	23
2	More Gas Stations	3.8%	20
3	More Toilet Facilities	3.3%	17
4	More Boat Ramps	3.1%	16
5	More Public Access	2.3%	12
6	Improved Boat Ramps	1.9%	10
7	More Development of Campgrounds	1.7%	9
8	Improved Water Quality	1.7%	9
9	More Control of Water Levels	1.3%	7
10	More Marinas	1.2%	6
10	More Docks	1.2%	6
10	More Parks	1.2%	6

The most frequent single suggestion is to Pickup Trash. Apparently, this is perceived as a greater problem on the Open Segment than on the pools. More Gas Stations was a need perceived by 3.8% of the respondents. This finding is much different from other areas. On Pools 24 and 25, this did not appear among the ten leading suggestions, although it ranked number six on Pool 26. The need for More Toilets resembled responses on the other pools.

Those who offered no suggestions for improvements represented 62.3% of the recreationists surveyed. This was the highest proportion of "No Comments" found on any portion of the river.

LATENT DEMAND ANALYSIS

Current recreation users are those who now demand resources through actual utilization of recreation sites. Obviously, not all people participate in river recreation, or those who do might desire to engage in more activities if improvements were made in facilities or river conditions. Those who do not participate or would increase their participation given certain changes comprise a latent (or unexpressed) demand for services and resources. The telephone survey captured and identified this type of demand.

During the survey, 4353 telephone calls were made, 79.0% resulting in completed interviews. Those 21.0% who chose not to grant the interview were counted in the study as Non-Respondents. The telephone calls were distributed among telephone area code districts as indicated in Table E1 of Appendix E. For analysis purposes, two subsets of the telephone interviews were established. The first, Random Telephone Respondents, refer to those interviewees who were participants only in the random sample portion of telephone survey. They were not involved in on-site interviews. The second set was the group interviewed in both the telephone and on-site surveys, and is denoted by the term Dual Survey Respondents in Tables of this document. Because each question may have had a different number of respondents, the total respondents are shown with each Table.

Latent Demand

Table 7 below summarizes responses from the random sample regarding recreation participation. One fourth of the random sample respondents (26.5%) had engaged in recreation on the Mississippi River at some time during the past year. Another 19.3% participated in some activities during the past two to four years, but not the last year. Thus, approximately half (45.8%) of the people surveyed had some recreation participation during the past four years. The other 54.2% who indicated no use during the past four years, represent latent demand. However the 19.3% in the latter group might reactivate their recreational use of the river if certain changes were implemented. Even the active recreationists might do more, given changes.

TABLE 7
RECREATION PARTICIPATION
BY RANDOM TELEPHONE RESPONDENTS

<u>Participation on Mississippi</u>		<u>Percent</u>
Participated Last Year	826	26.5%
Not Last Year, but 1-4 Years Past	601	19.3%
Participated Last Four Years	1427	45.8%
No Participation Last Four Years	1689	54.2%

Total Respondents to Question = 3116

Improvements Suggested

To identify barriers and enhancement to river recreation, interviewees were asked to identify Mississippi River recreation improvements that would cause increased use. Readers are cautioned that some responses were low. Those where at least 1.0% of respondents to the question gave a particular answer were considered significant for purposes of subsequent analysis. Each Table in the report shows the total number of respondents in order that no confusion results. Resource managers and decision-makers must weigh the response frequencies and weights prior to taking actions along the river.

All eight of the most frequently suggested improvements from the random telephone survey are shown in Table 8. In total, these are similar to results found in the on-site study. The major improvement cited by respondents was to Clean Up the River.** Nearly one in ten respondents (9.8%) indicated that such an effort would be a substantial improvement. Not only would this be an improvement, but 8.4% of those surveyed indicated that were the river cleaned up, a management action, that their recreation activity would increase. This recommendation was made far more than any other improvement or condition mentioned. Increased accessibility to the river is another major concern; and this is reflected by the frequency of responses such as More Boat Ramps (1.8%), Better Access (1.3%), and More Docks (.7%). Additional Parks (1.5%) and Picnic Areas (1.2%) ranked together as important improvements in the telephone survey, but did not appear so important during the on-site interviews.

TABLE *
RANDOM TELEPHONE SURVEY
IMPROVEMENTS SUGGESTED BY RESPONDENTS

RANK	IMPROVEMENT	FREQUENCY	PERCENT*	ON-SITE PERCENT
1	Clean up river	290	9.8%	-
2	Bring back the "Admiral"	74	2.5	-
3	More boat ramps	52	1.8	2.6%
4	More parks	43	1.5	.5
5	Better access	38	1.3	4.1
6	More picnic areas	35	1.2	.9
7	More docks	20	.7	1.1
8	More control of water levels	17	.6	4.4
Total Respondents to Question*		2955	100.0%	

* A full accounting of all responses is provided in column 2 of Table #2 of the Appendix E.

** Because Clean Up the River was so frequently mentioned, a subsample of original questionnaires was drawn to provide more definitive explanation of this answer. A sample of 100 survey forms coded "Clean Up the River" were composed of the following responses: 58% were Clean Up the River, Clean the River, or Clean Up Area; 27% were Clean Up Litter/Trash; 15% were Improve Water, Improve Water Quality, and Make Water Safe to Swim.

An item important in the telephone survey but not mentioned during the on-site interviews was to Bring Back the "Admiral." The "Admiral" is a 4000 passenger cruise boat that once operated out of St. Louis. During the survey period the "Admiral" was not open for business; many felt its absence (2.5% of random survey respondents), and that its return would be a definite improvement -- one which would increase recreation participation.

Major improvements desired by on-site interviewees but not by telephone interviewees included More Toilet Facilities, Pickup Trash, and More Gas Stations. Differences in percentage are shown in Table 8. These are perhaps nuisance or convenience items that seem more intensely important to recreationists at the site; telephone respondents may have forgotten such concerns when trying to recall recreation experiences.

Conditions Which Would Increase Participation

Respondents were asked to name conditions under which recreation would increase. "Cleaning up the River" is important if latent users are to be drawn into additional river recreation. Of those surveyed, 8.4% indicated this management action on the river would increase recreation participation. No other condition or circumstance was nearly so important. Table 9 shows the frequency of responses. Additional detail is available in Appendix E3.

TABLE 9
RANDOM TELEPHONE SURVEY:
TEN MOST FREQUENT CONDITIONS TO INCREASE PARTICIPATION

RANK	CONDITION	FREQUENCY	PERCENT*
1	Clean up river	246	8.4%
2	Reduce barge traffic	33	1.1
3	Bring back "Admiral"	32	1.1
4	Better information	24	.8
5	More parks	23	.8
6	Better access	18	.6
7	Better security	16	.5
8	Less development*	12	.4
9	Stabilize water levels	9	.3
10	More swimming	9	.3
Total Respondents to Question*		2914	100.0%

* A full accounting of all responses is provided in column 2 of Table E3 of Appendix E. "Less development" responses focussed on less shoreline development, less industry, fewer barge docks, fewer shacks. There was no clear trend.

Reduce Barge Traffic was the second most frequent response (1.1%). Such respondents felt that decreasing barge traffic would increase their recreation participation on the Mississippi.

Bringing Back the "Admiral" was the response of 1.1 percent of those surveyed, further evidence that many people would participate in this type activity if it were available. No other suggestion was made by more than one percent of the respondents. Three remaining suggestions were management-oriented, however, and therefore are important to note. Included in this category are Better Information (.8%), Better Security (.5%), and Stabilized

Water Levels (.3%), all recommendations which could be of interest to recreation managers. These are very small responses and may indicate that most of the population is unaware of specific problems or solutions which would impact their participation. The full list of responses and frequencies, allowing a complete comparison of on-site interviewees and telephone respondents, is reported in the Appendix E3.

Plans for Next Year

All random telephone survey respondents were asked if they planned to participate in river recreation "more," "less," or "the same" during the next year. Over three quarters (78.9%) indicated their use would remain the same. Of the remaining group, more (14%) stated that their use would increase than those (7%) who indicated an expected decline in activity. Based on these responses alone, increased participation is anticipated in the future, not counting the impact of changes and improvements.

It is possible to estimate an annual increase in recreation activity based on this question. By calculating the difference between recreationists who indicated that they currently use the river but intended to use it less (6.9% of respondents to the question) and non-recreationists who intended to use the river more (9.5%), an annual growth rate can be computed. This results in a net annual growth in recreation activity of 2.6%.

Some respondents explained why they planned to alter their recreational use of the river. Of those 272 persons who gave an answer to this question, 4.15% said the change was due to their age (too old). Second most frequent was No Longer Own Boat (11.4%), but this was balanced by the response Bought Boat (7.0%). More Spare Time (7.0%) was an important reason given for camping activity levels, along with Moving Away (6.3%). No other category accounted for more than 5% of the reasons for modifying patterns of use. Table 10 summarizes these findings. Table E4 of Appendix E provides a complete listing of responses to this question.

TABLE 10
RANDOM TELEPHONE SURVEY: MOST FREQUENT
REASONS GIVEN WHY RESPONDENT WOULD ALTER USE

RANK	REASON	FREQUENCY	PERCENT
1	Too old	113	41.5%
2	No longer own boat	31	11.4
3	Bought boat	19	7.0
4	More spare time	19	7.0
5	Moving away	17	6.3
	Total Respondents to Question*	272	100.0%

* A full accounting of all responses is provided in column 2 of Table E4 of Appendix E.

Recreationists In Comparison to Non-Recreationists

In order to gain additional insights into recommended river improvements and conditions which would alter participation, a comparison was made between those who used the river last year, those who did not use the river last year but used it 1-4 years ago, and those who had not participated in recreation use during the past 4 years. This latter group is labelled Non-Recreationists for purposes of analysis. Tables 11, 12 and 13 show a complete comparison of these groups.

There is a clear agreement among both recreationists and non-recreationists that cleaning up the river is the most important improvement that could be made and that it was most frequently cited as a condition that would increase recreation participation. As shown in Tables 11 and 12, recreationists appear to have somewhat stronger feelings about this concern (reference percentages in both tables under Clean Up River). The percentages within the recreation participants exceeds that of the non-recreationists on both questions.

In the total sample, Reduced Barge Traffic was ranked second behind Clean Up the River as a condition which would increase participation. There was a distinct variation between recreationist and non-recreationist responses to this question. Fewer non-recreationists felt strongly that reduced barge traffic would increase participation, but members of both classes of recreationists mentioned this concern as shown in Table 12.

Bring Back the "Admiral" was an important element in the latent demand of the telephone survey as a whole -- both as a condition to increase use and as a river improvement. Again, however, there are definite differences between groups responding to this question. As shown in Tables 11 and 12 those who used the river last year did not often make this response, nor did non-recreationists. The group which had participated in recreation during the past 1-4 years, but not last year, were much more frequent to volunteer this suggestion.

One other area of difference is apparent regarding conditions and improvements. Accessibility is a more dominant issue with recreationists than non-recreationists. Most of the suggestions for increased access in Tables 11 and 12 arose among these participants -- especially those who used the river last year. Better Access, More Boat Ramps, More Picnic Areas, More Parks, More Swimming, More Docks, More Camping and More Sandbars all fit this pattern.

In the telephone survey, those who stated that their intended use would be "More" or "Less" than last year were asked to give the reason for the anticipated change in river use. Those who indicated their recreation would remain the "Same" were not included in this question. Table 13 summarizes results of this question.

TABLE 11

RECREATIONISTS/NON-RECREATIONISTS:
COMPARATIVE FREQUENCY OF SUGGESTED
IMPROVEMENTS FROM TOTAL RESPONDENTS TO
TELEPHONE SURVEY

IMPROVEMENT	PARTICIPATION IN RECREATION					
	LAST YEAR		1-4 YEARS		NONE IN LAST 4 YEARS	
No comment	734	66.2%	384	70.3%	1382	85.6%
More Boat Ramps	61	5.5	8	1.5	10	.6
More Picnic Areas	21	1.9	5	.9	13	.8
Better Access	45	4.1	7	1.3	10	.6
New Locks and Dams	1	.1	1	.2	2	.1
More Swimming	8	.7	3	.6	5	.3
More Eating Places	5	.4	6	1.1	5	.3
Clean Up River	112	10.1	62	11.4	131	8.1
Bring Back "Admiral"	19	1.7	28	5.1	29	1.8
More Flood Control	2	.2	1	.2	1	.1
More Parks	17	1.5	14	2.6	14	.9
More Docks	14	1.3	8	1.5	3	.2
More Boat Rental	0	0.0	3	.6	1	.1
More Camping Areas	11	1.0	4	.7	4	.2
More Tour Boats	0	0.0	1	.2	0	0.0
More Control of Water Levels	24	2.2	5	.9	0	0.0
More Parking	1	.1	3	.6	1	.1
More Toilets	12	1.1	0	0.0	0	0.0
Wheelchair Access	0	0.0	1	.2	1	.1
More Trash Cans	2	.2	2	.4	0	0.0
More Development of Campgrounds	1	.1	0	0.0	1	.1
More Gas Stations	5	.4	0	0.0	1	.1
Clear brush	4	.4	0	0.0	0	0.0
More Sand Bars	9	.8	0	0.0	0	0.0
Total Respondents to Question	1108	100.0%	546	100.0%	1614	100.0%

TABLE 12

RECREATIONISTS/NON-RECREATIONISTS:

COMPARATIVE FREQUENCY OF CONDITIONS
WHICH WOULD INCREASE PARTICIPATION TAKEN FROM
TOTAL RESPONDENTS TO TELEPHONE SURVEY

CONDITION	RECREATION PARTICIPATION					
	LAST YEAR		1-4 YEARS		NONE IN LAST 4 YEARS	
No Comment	893	81.4%	412	77.2%	1420	89.2%
Less Development	6	.6	2	.4	4	.2
Clean Up River	95	8.7	63	11.8	107	6.7
Boat Rentals	1	.1	2	.4	0	0.0
Better Security	3	.3	8	1.5	6	.4
More Swimming Areas	5	.5	2	.4	3	.2
More Camping Areas	6	.6	1	.2	4	.2
More Parks	14	1.3	5	.9	4	.2
Bring Back the "Admiral"	6	.6	16	3.0	10	.6
Better Information	8	.7	5	.9	11	.7
If Owned a Boat	1	.1	3	.6	3	.2
Reduced Barge Traffic	27	2.5	7	1.3	7	.4
Lifeguard	2	.2	1	.2	2	.1
More Tour Boats	0	0.0	1	.2	1	.1
More Boat Docks	6	.6	0	0.0	1	.1
Less Police	1	.1	1	.2	0	0.0
More Toilets	2	.2	0	0.0	2	.1
Better Access	8	.7	5	.9	5	.3
Stabilize Water Levels	13	1.2	0	0.0	1	.1
Total Respondents to Question	1097	100.0%	535	100.0%	1591	100.0%

As Table 13 shows, of those who answered the question, the most frequent reason for change was their age (Too Old: 41.5%). However, further analysis shows that the vast majority who indicated they were Too Old were included in the non-recreationist group. In fact, nearly two-thirds (65.5%) of non-recreationists gave age as their reason for anticipating a change in personal recreation use of the Mississippi. The next most frequent responses of the overall sample were opposites: No Longer Own Boat and Bought Boat. Nearly all who gave these responses were recreationists at some point in the past 4 years.

TABLE 13

RECREATIONISTS/NON-RECREATIONISTS:
REASONS GIVEN IN TELEPHONE SURVEY
FOR USING THE RIVER "MORE" OR "LESS"

REASON	RECREATION PARTICIPATION					
	LAST YEAR		1-4 YEARS		NONE IN LAST 4 YEARS	
No Longer Own Boat	12	16.4%	16	22.9%	5	3.6%
Too Old	10	13.7	12	17.1	91	65.5
Handicapped	0	0.0	1	1.4	4	2.9
Too Dangerous	0	0.0	2	2.8	9	6.5
Children Getting Old	5	6.8	4	5.7	0	0.0
Bought Boat	12	16.4	8	11.4	1	.7
Moving Away	7	9.6	5	7.1	5	3.6
Just Moved Into Area	0	0.0	3	4.3	1	.7
Boat at a Lake	2	2.7	1	1.4	1	.7
Too Busy	2	2.7	4	5.7	2	1.4
Will Be Working There	1	1.4	0	0.0	1	.7
More Spare Time	9	12.3	6	8.6	5	3.6
More Friends Doing It	2	2.7	0	0.0	0	0.0
Gas Too Expensive	4	5.5	0	0.0	1	.7
Costs Too Much	2	2.7	0	0.0	1	.7
Dirty	3	4.1	3	4.3	6	4.3
No Time	2	2.7	1	1.4	2	1.4
Sick	0	0.0	4	5.7	4	2.9
Total Respondents to Question	73	100.0%	70	200.0%	139	100.0%

Present Participation (Via Telephone Survey)

Those who indicated recreation activity over the past year were asked to identify specific use categories describing their participation. The most frequent activities are shown in rank order in Table 14. Field interview results or "On-Site Rank," is also included to allow comparison with the current use field assessment. Multiple activity reports were allowed. For example, a person could have been engaged in both boating and picnicking during a river visit.

TABLE 14
TEN MOST FREQUENT ACTIVITIES FOR RANDOM TELEPHONE
SAMPLE AND ON-SITE SURVEY**

ACTIVITY	RANK	FREQUENCY*	ON-SITE RANK	DIFFERENCE IN RANKS
Viewing the River	1	23.0%	1	0
Picnicking	2	16.0	4	-2
Bank Fishing	3	11.2	7	-4
Loafing/Relaxing	4	11.1	2	+2
Swimming	5	11.0	8	-3
Boat Fishing	6	10.2	6	0
Water Skiing	7	8.9	5	2
Runabout	8	8.6	3	5
Fishing Boat	9	6.6	9	0
Sunbathing	10	6.5	10	0

* Percentages will not total 100% due to multiple usage by respondents.

** A full accounting of all responses to this question from the telephone survey is provided in Table E5 of Appendix E. For a full accounting of activity from the on-site survey, see Table D-10 of Appendix D.

The most frequently reported activity as shown in Table 14 was Viewing the River (23.0%) and Picnicking was second (16.0%). In addition, Loafing/Relaxing was a frequently cited activity (11.1%), and Swimming (11.0%) ranked fifth -- despite complaints by many regarding the cleanliness of the water. Predictably, fishing was a major activity based upon the interviews. Bank Fishing ranked third (11.2%) and Boat Fishing was sixth (10.2%). More than one in every ten respondents engage in each of these individual activities, indicating a substantial portion of the respondents use the Mississippi as a fishing resource.

As would be expected, Runabout Boating was important (8.6%), and was complemented by Fishing Boat activity (6.6%) according to Table 14. It should be noted that for the purposes of this study, Boating was divided into nine categories. A Composite Boating category may well show the most significant river activity of all, but the aggregate category is not particularly useful in measuring and describing activity in such a way that management decisions will ultimately result. There is a significant difference between Houseboats and Runabouts for example. Because multiple use answers were allowed, results from individual categories are not strictly additive. Other important uses were Water Skiing (8.9%), Sunbathing (6.5%), Day Hiking (6.2%), and Wildlife Viewing (5.9%). No other activity was reported by more than 5% of the respondents in the telephone survey.

Comparison of Activity Reports: Telephone and On-Site

As Table 14 indicates, the most frequent activities found in the telephone survey were quite similar to the on-site field survey results. All of the ten most frequently-reported activities in the random telephone survey were the same as in the on-site survey. Although activity data are not exactly the same, the rankings can be compared. Findings shown in Table 14 indicate remarkable, but reassuring, consistency between the two surveys.

The largest differences in rankings involved Runabout Boating, Bank Fishing, and Swimming. Runabout Boating is ranked eighth in the telephone interview survey, while it was ranked third in the on-site interviews.

Bank Fishing and Swimming both ranked higher among telephone survey respondents than among on-site interviewees. This seems reasonable since the on-site interviews were linked to known identifiable recreation sites. Both Bank Fishing and Swimming may occur at nearly any river location -- whether or not it is officially known and recognized as a recreation site or facility. Any one can enter the water to swim or go bank fishing. There was no available mechanism for controlling and capturing such activities in the on-site survey, so these categories may have been under-reported in the on-site surveys. It is more difficult and expensive to manage and control such activities, but this survey provides some insights for these behaviors.

Dispersed Use

A comparison of total recreation use estimates may provide additional insight regarding river visitation. Total visitor-days measured in the on-site survey was 448,400 compared to 536,000 from the telephone survey -- a difference of 16 percent. The on-site survey was taken only at defined access points, so that use by recreationists at points not defined as access points were not estimated. The telephone survey involved no such limitations, however. According to a river recreation study on the Lower St. Croix Riverway, 12% of total visitation was from recreationists who gained access to the river at a point not defined as an access point (Becker, Nieman, and Gates, 1979).

The majority of these users were people with residences on the Riverway itself. Because the GREAT III reach of the Mississippi has relatively few residences, dispersed use in the study area may be at lower rates. No specific estimates are available. However, this type of use may explain some of the difference between use estimates between the telephone survey and on-site survey.

PROJECTIONS OF FUTURE USE

For the purposes of projecting future use in this study the mean of the upper limits of the 95% confidence intervals of the on-site and telephone visitor-day estimates was used as the 1981 baseline total use figure. Using this as the benchmark (529,600 visitor-days) gives the best assurance that aggregate demands can be met in the future. To use lower estimates could put resource managers at-risk of underestimating demands and being unable to satisfy user needs in the years to come.

Once this benchmark was established, three optional projection techniques were developed. The first was an estimate of recreation activity based on the assumption that activity would change in the same proportion and direction as population in the service area. The second was based on respondents plans to use the river either more or less frequently in the future. The third technique involved application of latent demand impact multipliers under assumed management actions. Findings under each option are presented below.

Option I: Change of Parallel to Population Trends

Projections for year 1990 and 2000 recreation use were keyed to population projections furnished by the Corps of Engineers. These projections are shown in Appendix F, page F-1. The proportionate change in population was simply extended to recreation visitation. Results are shown in Table 15, page 54.

The method implies that recreation activity will increase due to an increasing population trend. If this option is selected, recreation visitor days would be expected to grow from 529,600 in 1981 to 567,000 by the year 2000.

Option II: Growth Based on Stated Visitation Plans

During the regional telephone survey, respondents were asked whether they intended to alter their recreation plans in the next twelve months. This method assumes that individuals will indeed follow through with their intentions. Further, it does not explicitly consider any improvement of river conditions or facilities. A net annual growth in recreation activity of 2.6% was calculated as described on page 46. Extending this growth rate into the future and adjusting results upward to recognize the increased population bases of 1990 and 2000 results in year 1990 and 2000 projections shown in Table 16. Under this option, visitor-days would increase to 890,000 by the year 2000.

Option III: Accommodation of Latent Demands

According to the Latent Recreation Demand Analysis certain specified improvements or modified conditions to the river will generate additional usage. To accommodate these upward shifts in demand, impact multipliers are presented below to allow the user to adjust projections upward by fixed proportions if changes in river conditions or improvements are incorporated on the GREAT III reach. Resource Managers who wish to evaluate impacts associated with strategies that would capture latent demands can use these multipliers to adjust the projections presented under Option I or Option II above.

If broad management strategies are developed to alter conditions and improve the river, a measure of the potential impacts is below for the largest of the latent demand measures previously presented. Improvements or altered conditions suggested by at least 1.0% of the regional telephone survey respondents are displayed in Tables 17 and 18. Two of the items listed were considered by respondents as improvements and conditions: Clean Up the River and Bring Back the "Admiral". Thus, a range can be presented for these changes.

TABLE 15

OPTION I: PROJECTED RECREATION USE ON GREAT III FOR YEAR 1990 AND 2000 BASED UPON POPULATION TRENDS

YEAR	VISITOR-DAYS*	ACTIVITY-DAYS**
1981	529,600	1,514,700
1990	549,500	1,571,600
2000	567,000	1,621,600

* Assumes use by residents from outside service area will remain a constant proportion of total use.

** Assumes average party size of 2.86 persons for each time period. All figures are rounded to the nearest hundred.

TABLE 16

OPTION II: PROJECTED RECREATION USE ON GREAT III FOR YEAR 1990 AND 2000 BASED UPON STATED INTENTIONS OF TELEPHONE SURVEY RESPONDENTS

YEAR	VISITOR-DAYS*	ACTIVITY-DAYS**
1981	529,600	1,514,700
1990	692,200	1,979,692
2000	890,000	2,545,400

* Assumes use by residents from outside service area will remain a constant proportion of total use.

** Assumes average party size of 2.86 persons for each time period. All figures are rounded to the nearest hundred.

TABLE 17
 IMPACT MULTIPLIERS: LATENT DEMANDS ASSOCIATED
 WITH SUGGESTED IMPROVEMENTS TO THE RIVER

IMPROVEMENT	LATENT DEMAND OF POPULATION	IMPACT MULTIPLIER
Clean up River	9.8%	1.098
Bring Back the "Admiral"	2.5	1.025
More Boat Ramps	1.8	1.018
More Parks	1.5	1.015
Better Access	1.3	1.013
More Picnic Areas	1.2	1.012

TABLE 18
 IMPACT MULTIPLIERS: LATENT DEMANDS ASSOCIATED
 WITH CONDITIONS THAT WOULD INCREASE PARTICIPATION

CONDITION	LATENT DEMAND OF POPULATION	IMPACT MULTIPLIER
Clean Up River	8.4%	1.084
Reduce Barge Traffic	1.1	1.011
Bring Back the "Admiral"	1.1	1.011

* See pages 42-43 for an explanation of the difference between these tables.

If management strategies are incorporated over the next twenty years to gradually "clean up" the river, the best estimate is that recreation activity would increase between 8.4 - 9.8% based upon the latent demand analysis, resulting in an impact multiplier of 1,084 to 1,098. Thus, in the year 2000 the projected 862,500 visitor-days might be expected to reach a level from 935,000 to 947,025. Estimates of the impact of other factors shown on Tables 17 and 18 can be attained in an analogous manner simply by multiplying the selected projection of recreation use times the corresponding impact multiplier.

These estimates are at best an indicator of the magnitude of impacts to be expected from management strategies designed to bring about the improvements or conditions presented. They should not be considered precise, fine-tuned measures. However, this technique is the only one currently available to monitor impacts and can provide needed direction when used as a general guide to policy. Use of the impact multipliers is the best tool currently available for this purpose.

It is beyond the scope and intent of this study to define specific management strategies that public agencies or the private sector may implement in an attempt to either increase, decrease or maintain recreation use levels. Such actions remain the prerogative of individual agencies within their jurisdictions.

SURFEIT/DEFICIT ANALYSIS

Results from the Surfeit-Deficit Analysis show two general indicators of the need for a surplus of recreation lands in the future. First, the Land Adequacy Index allows analysis in terms of the intensity of land use. Second, the numerical calculation of surplus or deficit acreage provides guidance regarding the magnitude of needs for land under alternative assumptions. Results of the study are presented below; first for year 1981 and subsequently for year 1990 and 2000 under two optional projections of future recreation use levels.

1981 LAND ADEQUACY

The Land Adequacy Index (LAI) for GREAT III, Pools 24, 25, 26 and Open Segment based upon 1981 visitor-days and acreage data is shown in Table 19 below. In addition, the 1981 surfeit or deficit of lands has been calculated based upon the methodology described on page 23 of this report.

TABLE 19

1981 Land Adequacy

Area	LAI	Required Acreage**	1981 Acreage	Surfeit (+) Deficit (-)
Pool 24	6.06	4,211	8,545.0	+ 4,334.0
Pool 25	14.86	8,057	6,669.2	- 1,387.8
Pool 26	13.91	16,008	14,157.9	- 1,850.1
Open Segment	14.23	8,779	7,068.7	- 1,110.3
GREAT III	13.20	36,440.8	36,440.8	-0-

** Based upon benchmark of 12.30 visitor-days per acre intensity of use.

Results of this methodology show that GREAT III had an adequate amount of land to meet 1981 recreation demands. The aggregate LAI of 12.30 visitor-days per acre was used as the benchmark for evaluating the pools and Open Segment.

Pool 24 had the lowest intensity of use at 6.06 visitor-days per acre -- less than half of the aggregate LAI on GREAT III. Land acreage is subject to much more intensive use on other reaches within GREAT III. According to Table 19, there is a recreation land surfeit of 4,334 acres on Pool 24. However, it should be noted that this is an aggregate measure and does not imply that any individual recreation site is unneeded or contains excessive acreage. Individual sites must be evaluated only in conjunction with a multitude of other factors including predominant types of use, physical features, site characteristics, design limitations and other issues. Likewise, any site-specific land acquisition decisions in deficit areas must be made only after consideration of these same factors.

Pool 25 had the highest intensity of use when measured in visitor-days per acre (14.86). This was slightly above the overall 12.30 value for GREAT III, and comparable to Pool 26 and the Open Segment. Table 19 indicates a deficit of lands on Pool 25 of 1387.8 acres.

Pool 26 was quite comparable to Pool 25. The 1981 level of LAI was lower at 13.91 visitor-days per acre, but exceeded the GREAT III aggregate of 12.30. Absolute recreation visitation was highest on Pool 26, and as a result the total acreage needs on this pool were greater than other pools. Approximately 1,850.1 additional acres of recreation land are needed.

Needs on the Open Segment were quite consistent with both Pool 25 and 26. Intensity of use is somewhat higher than the aggregate for GREAT III, but is between the range of pools 25 and 26. Table 19 indicates a deficit of 1,110.3 acres of recreation land.

The conclusion is not intended to recommend that any lands be acquired. These are decisions that can only be made by appropriate public agencies and private entities along the river. Such decisions require considerations specific to each area, site characteristics, cost, and potential lands available. An alternative to land acquisition would be increased intensity of use on existing acreage.

Because these are estimates for 1981 and the future may bring changes, the surfeit-deficit analysis has been extended to help evaluate impacts in year 1990 and 2000. Three scenarios are presented, based on alternative assumptions of the future. Projected LAI's assuming no change in acreage were calculated for guidance on how the growth or decline in recreation activity changes will impact intensity. Then, the estimated surfeit or deficit is presented.

Option I: Change Parallel to Population

Option I assumes future recreation use will directly correspond to population change. For this option, Table 20, page 59, documents the estimated LAI's and surfeits-deficits for GREAT III, Pools 24, 25, 26 and the Open Segment for year 1990 and 2000. Because use projections show an increase in recreation activity under this alternative, use intensities are projected to increase in magnitude. With more users in the future, the LAI for GREAT III will grow to 15.56 visitor-days per acre by the end of this century based upon this table. Land requirements would also increase with the result being a deficit of recreation land (9,657.2 acres) on GREAT III in year 2000.

Lands along Pool 24, the least intensively used lands, would become more intensively used. The LAI would grow to 7.63 visitor-days per acre. In addition, the surplus acreage in this pool would decline to 3,244 acres by year 2000. This is still below the 12.30 average of GREAT III in 1981.

On Pool 25, intensity also grows proportionately as the LAI rises to 18.79 -- a level exceeding the benchmark 12.30 visitor-days per acre on GREAT III. The deficit of lands would increase to 3,417.8 acres, implying that in year 2000 land needs would exceed the current supply.

On Pool 26, the LAI increases to 17.58 and intensity of use is greater than current levels. This results in a deficit of nearly 6,100 acres by year 2000. Results are analogous on the Open Segment, although the LAI increases to 18.05 and the surplus is 3,305.3 acres.

Again, these projections are based upon the assumption that recreation use will be changing in direct proportion to population. Those who disagree with this assumption may examine Option II.

Option II: Growth Based on Stated Visitation Plans

Under Option II an annual recreation activity growth rate of 1.6% adjusted to population change is assumed. This set of projections shows substantial growth in recreation use over the next 20 years. Table 21 shows both resultant intensities of use assuming no acreage changes and the associated surfeits-deficits.

Using this set of projections, the GREAT III reach will increase in intensity of use to 24.42 visitor-days per acre by year 2000 -- nearly double the current intensity. At the same time, there would be a deficit of 19,835.2 acres by 1990 and 35,916.2 acres by year 2000. The alternative to additional land acquisition is increasing the intensity at which existing lands are used. The estimates show the trade-off of either doubling the intensity of use or acquiring nearly 6,000 additional acres, if year 2000 demands are to be met.

Despite increased use in the future, there is projected to be low intensity of use (11.99 visitor-days per acre) and a slight surplus of land along Pool 24. Intensities on Pools 25, 26 and Open Segment will nearly double current levels by the year 2000. All will far exceed Pool 24 based on the methods used in the analysis. The largest land deficit will be along Pool 26 which has the heaviest absolute visitor usage. Over 17,600 acres will be needed unless intensities of use are to double current levels. Likewise, Pool 25 and the Open Segment will have needs of over 9000 acres each based on these projections.

Option III: Accommodation of Latent Demands

Adjustments for increased demand due to broad management actions geared to the capture of latent demands can be calculated in a manner exactly analogous to that described in Findings - Recreation Use Projections: Accommodation of Latent Demands. This method involves a simple multiplication of the impact multipliers for improvements or conditions cited to increase participation times the projected indicator of interest. Multipliers were presented in Table 17 and 18, page 55.

Summary

It should be remembered that land requirements presented in this study are based on recreation projections. Different projections will generate much different conclusions as illustrated above under Option I and II. Final decisions by agencies or private groups regarding land needs should temper the numerical need estimates presented in this study with the trade-offs on intensity of use. In addition, a range of external factors must be considered prior to any site or facility decision. Such factors as cost, availability of land, type of recreation use desired, site characteristics, physical features, and proximity to population centers must all be evaluated in addition to estimated needs.

This study stops short of extending analysis to specific facilities along GREAT III. Such a task would be a major undertaking and is the prerogative of appropriate agencies with jurisdiction along the river. Like land needs, these too are subject to all the considerations described above and more.

On the other hand, the study has presented for the first time ever an aggregate analysis of recreation land needs of the GREAT III segment of the Mississippi River. Used in combination with current use patterns, use projections for the future, and the unique accounting for latent demands generated in previous portions of the study, resource managers and decision-makers can evaluate for the first time the trade-offs of adding new lands versus intensifying use, the magnitude of land acquisition needed for the remainder of this century, and the potential impact of a few broad management actions. Prior to development of this tool, no mechanism was available for any quantitative estimates of this nature.

TABLE 20

OPTION I: PROJECTED SURFEIT-DEFICIT OF
RECREATION LANDS FOR YEAR 1990 AND 2000

Area	Visitor-Days*	LAI	1981 Acreage	Required Acreage**	Surfeit (+) Deficit (-)
Pool 24					
1990	63,200	7.40	8,545.0	5,138	+ 3,407.0
2000	65,200	7.63	8,545.0	5,301	+ 3,244.0
Pool 25					
1990	121,400	18.20	6,669.2	9,870	- 3,200.8
2000	125,300	18.79	6,669.2	10,187	- 3,517.8
Pool 26					
1990	241,200	17.03	14,157.9	19,610	- 5,452.1
2000	248,900	17.58	14,157.9	20,236	- 6,078.1
Open Segment					
1990	123,700	17.50	7,068.7	10,057	- 2,988.3
2000	127,600	18.05	7,068.7	10,374	- 3,305.3
GREAT III					
1990	549,500	15.08	36,440.8	44,675	- 8,234.2
2000	567,000	15.56	36,440.8	46,098	- 9,657.2

* Assumes no change in proportionate distribution of visitor-days among pools and Open Segment in future years. Rounded to nearest hundred.

TABLE 21

OPTION II: PROJECTED SURFEIT-DEFICIT OF
RECREATION LANDS FOR YEAR 1990 AND 2000

Area	Visitor-Days*	LAI	1981 Acreage	Required Acreage**	Surfeit (+) Deficit (-)
Pool 24					
1990	79,600	9.32	8,545.0	6,471	+ 2,074.0
2000	102,400	11.99	8,545.0	8,325	+ 220.0
Pool 25					
1990	153,000	22.94	6,669.2	12,439	- 5,769.8
2000	196,700	29.49	6,669.2	15,992	- 9,322.8
Pool 26					
1990	303,900	21.47	14,157.9	24,707	-10,549.1
2000	390,700	27.60	14,157.9	31,764	-17,606.1
Open Segment					
1990	155,700	22.03	7,068.7	12,659	- 5,590.3
2000	200,200	28.32	7,068.7	16,276	- 9,207.3
GREAT III					
1990	692,200	19.00	36,440.8	56,276	-19,835.2
2000	890,000	24.42	36,440.8	72,357	-35,916.2

*Assumes no change in proportionate distribution of visitor-days among pools and Open Segment in future years. Rounded to nearest hundred.

**Based upon 12.30 visitor-days per acre intensity of land use.

APPENDICES

APPENDIX A

"Natural Areas Inventory, 1981" is a separate free-standing document which constitutes Appendix A. The document describes unique biological and geologic communities in the study area, methods used in the inventory and maps to locate areas along the Mississippi. It was prepared by the Missouri Department of Conservation under contract to Oblinger-McCaleb.

APPENDIX B

"Recreation Area and Facility Inventory, 1981" is a separate, free-standing document which constitutes Appendix B. The document describes recreation facilities, explains inventory procedures, and summarizes recreation facilities and sites. It was prepared by Oblinger-McCaleb from secondary source data from a report entitled "Recreation Facility Inventory, 1978", published by the Upper Mississippi River Conservation Committee in September, 1978. Missouri data were recorded by the Missouri Department of Conservation and the Illinois Department of Conservation recorded Illinois sites. This was supplemented by Oblinger-McCaleb site observations during a familiarization trip and from input of GREAT III Work Group members.

APPENDIX C
SUPPLEMENTARY MATERIALS CITED IN METHODOLOGY

ON-SITE OBSERVATION FORM
Great III Recreation Study - Mississippi River

OFFICE USE ONLY
DO NOT WRITE IN
THIS SPACE

1. Observation and survey i.d. number _____
2. Team member's name _____
3. Date (month/day) _____
4. Observed on ☐ pool or ☐ open river ☐ St. Louis segment
5. If observed on pool, give pool number _____
6. River mile _____
7. Side of river (looking downstream) ☐ left or ☐ right
8. Location ☐ Island ☐ Shore ☐ Water 8a. Facility or site name _____
9. Time _____ A.M. or _____ P.M.
10. Weather: ☐ Clear sky ☐ Cloudy sky ☐ Foggy ☐ Rain ☐ Snow ☐ Other _____
11. Winds ☐ Light ☐ Moderate ☐ Strong
12. Temp ☐ Seasonal ☐ Below normal ☐ Above normal
13. Water Conditions ☐ Calm ☐ Choppy ☐ Very rough
14. River stage (to be filled in by others): ☐ High ☐ Normal ☐ low

Interviewee description (by observation)

15. Sex ☐ Male ☐ Female
16. Age ☐ 17 - 35 ☐ 36 - 55 ☐ 56 and over
17. Race ☐ White ☐ Non-White
18. Stage of Visit ☐ Beginning ☐ Middle ☐ End

Hello! My name is _____ I'm a student at _____ and I'm assisting in a year-long study of outdoor recreation on the Mississippi River.

I'd like to ask you a few questions on how you have (or will be) using the River for recreational purposes. ok? (If the answer is no, politely end the conversation. By observation, attempt to complete questions #19 & 20 below. If yes, then verify as necessary the "stage of visit" observation and continue to fill out the survey.)

19. How many people traveled in your vehicle to this location?
20. What type of vehicle did you come in?
 - ☐ car (include pickups w/out camper, and vans here)
 - ☐ car with camping trailer
 - ☐ bus
 - ☐ camper
 - ☐ boat
 - ☐ motorcycle
 - ☐ other _____

ON-SITE SURVEY FORM
Great III Recreation Study - Mississippi River

OFFICE USE ONLY
DO NOT WRITE IN
THIS SPACE

Observation and survey i.d.number _____

21. Is this the first time you've visited the Mississippi River for recreation?

☐ yes
☐ no

22. How long is this stay on the river?

☐ 0 - 4 hours
☐ 1/2 - 1 day
☐ day and night
☐ 2 days and 2 nights (weekenders)
☐ 3 days to one week
☐ one week to two weeks
other _____

23. How many times a year do you normally visit the river?

☐ once
☐ twice
☐ 3 - 6
☐ over 6 times
other _____

24. If there were more than one vehicle in your group, how many? _____

25. How far away from home are you?

☐ 0 - 25 miles
☐ 26 - 50
☐ 51 - 100
☐ 101 - 250
☐ over 250 miles

26. Would you mind giving me your zip code and the area code and just the first three digits of your telephone number so we know, in general, the areas from which recreationalists are coming?

Interviewee's zip code _____

Interviewee's area code _____

Interviewee's prefix (first three numbers) _____

(CONTINUE ON BACK SIDE)

MULTIPLE-CARD LAYOUT FORM

Company

Chirer - Macaleb

Application

Mississippi River Recreation Survey - In-Field

Job No. 05-2000 Sheet No. _____

Sheet No.

QUESTIONNAIRE NO.										ACTIVITY										IMPROVEMENT										ACTIVITY										PREFIX										ACTIVITY										CARD NO.																																																																																																																																																																																																																	
TEAM MEMBER #										DATE										LOCAL #										POOL #										RIVER MILE										SIDE										LOCAL 2										TIME										WEATHER										WIND										TEMP										WATER										AUX										RACE										VISIT STAGE										Q1										Q2										Q3										Q4										Q5										Q6										Q7										ZIP										AREA CODE										PREFIX										ACTIVITY										CARD NO.									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80																																																																																																																																																																																														

LATENT DEMAND TELEPHONE SURVEY
Great III Recreation Study - Mississippi River

CODING USE ONLY

1. Survey i.d. number _____
 area code telephone number
2. Team member's name _____
3. Date (month/day) _____
4. Hello, my name is _____, I'm a
student at the University of Missouri. We're studying
outdoor recreation along the Mississippi River, and
would like you to help. Would you mind answering just
a few questions? ☐ Agree ☐ Refuse
5. (If refuse) thanks, hang up.
(If agree) in the past twelve months did you partici-
pate in outdoor recreation on the Mississippi River
☐ Yes ☐ No
6. (If no) did you participate in the last 4 years
☐ Yes ☐ No
(Go to question #7)
(If yes) did you participate in (read list as appropriate)

	Yes/No (enter one)	Amount on Miss. River (# days)	Why not More (enter response)
Cottage Use	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Camping (if yes, ask below)			
hard top unit	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
tent	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
other	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Boating (if yes, ask below)			
Canoe	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
fishing boat	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
sail boat	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
runabout	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
pontoon	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
cabin cruiser	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
tour boat	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
house boat	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
other (specify)	<input type="checkbox"/> <input type="checkbox"/>	_____	_____

Latent Demand (cont'd)

Do Not
Write in
This Spacei.d. number _____
area code _____ telephone number _____

	Yes/No (enter one)	Amount on Miss. River (# days)	Why not More (enter response)
Loafing, relaxing	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Fishing (If yes, ask specific below)			
bank	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
boat	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
set lines	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Picnicking	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Swimming	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Hunting (If yes, ask specific below)			
waterfront	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
small game	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
deer	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
turkey	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
target/trap shoot	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Hiking (If yes, ask specific below)			
day	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
overnight	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Viewing the river	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
4-wheel-driving	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Motorcycling	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Snowmobiling	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Bicycling	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Trapping	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Wildlife viewing	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Rapelling	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Sunbathing	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Water skiing	<input type="checkbox"/> <input type="checkbox"/>	_____	_____

Latent Demand (cont'd)

Do Not
Write in
This Space

i.d. number _____
area code _____ telephone number _____

	Yes/No (enter one)	Amount on Miss.River (# days)	Why not More (enter response)
Horseback riding	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Cross-country skiing	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Caving	<input type="checkbox"/> <input type="checkbox"/>	_____	_____
Other			

7. Estimating for next year, do you think you'll use the river
(for outdoor recreation) ☐ Less ☐ More ☐ The same

Why _____

8. Are there any other recreational facilities or improvements
you would like to see on the Mississippi River?

9. Are there any conditions or circumstances which could be changed
to increase your use of the River for outdoor recreation.

10. What are your two or three favorite outdoor recreation
areas at the present time whether or not they are on the
Mississippi River.

THANK YOU VERY MUCH. GOODBYE

MULTIPLE-CARD LAYOUT FORM

BLINGER-MCALIB

Company

Application

MISSISSIPPI RIVER RECREATION SURVEY

Date Jan '81

Job No.

Sheet No.

QUES ID	TEAM NO.	DATE	ANS
1	12	13	1
2	12	13	2
3	12	13	3
4	12	13	4
5	12	13	5
6	12	13	6
7	12	13	7
8	12	13	8
9	12	13	9
10	12	13	10
11	12	13	11
12	12	13	12
13	12	13	13
14	12	13	14
15	12	13	15
16	12	13	16
17	12	13	17
18	12	13	18
19	12	13	19
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89	12	13	89
90	12	13	90
91	12	13	91
92	12	13	92
93	12	13	93
94	12	13	94
95	12	13	95
96	12	13	96
97	12	13	97
98	12	13	98
99	12	13	99
100	12	13	100

Use of Aerial Photography

Aerial photography was used in this study as a back-up to assist in site identification and to verify ground-based observations at sample sites on the Mississippi River. A fly-over was conducted after several postponements due to inclement weather. Simultaneously, field survey personnel conducted ground based counts at selected sites. Time-of-day conversion factors were verified from the aerial counts. In addition, the photography was examined to see if major sites were missing from the sampling frame.

The aerial process suffered from inclement weather, resultant postponements, and high water levels during the fly-over which may have influenced use; however, it was useful for site verification and checking. Instead of using aerial photography to calculate a comparative use estimate for validation of the on-site survey, a use estimate was developed from the regional telephone survey.

Time-of-day comparisons were made to test the sample selection process. The percentage visitation for morning and afternoon are shown below:

	<u>On-Site Survey</u>	<u>Aerial Photography</u>
A.M.	40.1%	37.2%
P.M.	59.9%	62.8%

This provided support for the conclusion that sampling was proceeding correctly regarding the time-of-day interviews were being conducted.

Jefferson National Expansion Memorial

Because of the large volume of visitors to the Jefferson National Expansion Memorial, traffic volume was sampled on this entire recreation site instead of interviewing a sample of on-site visitors. This single high volume site would have skewed the entire study of typical Mississippi River recreation activities.

During the sampling, it became apparent that much of the traffic was related to non-river oriented activity: parking for local business establishments and parking by downtown employees. Thus, the traffic counts were abandoned as a measure of recreation activity at this site.

The best information for this site is the National Park Service which reports the following visitation data:

<u>Year</u>	<u>Visitors</u>
1981	2,571,181
1980	2,080,382

However, approximately 500,000 persons in 1981 visited the park in association with a special July 4th celebration in the St. Louis area. Park officials expect visitation to stabilize at the 2,000,000 visitor level in the future.*

* Reported by Richard Wilt, Chief of Museum Services, Jefferson National Expansion Memorial, National Park Service.

APPENDIX D
ON-SITE INTERVIEW RESULTS

TABLE D1
AGE DISTRIBUTION OF ON-SITE INTERVIEW RESPONDENTS

AREA	AGE		
	17 - 35	36 - 55	56 - Over
Pool 24	158 32.2%	190 39.1%	138 28.4%
Pool 25	241 36.9%	284 43.4%	129 19.7%
Pool 26	591 47.4%	467 37.5%	188 15.1%
Open	252 48.6%	188 36.3%	78 15.1%
Total	1252 43.0%	1129 38.7%	533 18.3%

TABLE D2

RACE AND SEX OF ON-SITE INTERVIEW RESPONDENTS

AREA	RACE		SEX	
	WHITE	NON-WHITE	MALE	FEMALE
Pool 24	463 96.3%	17 3.5%	397 81.4%	91 18.6%
Pool 25	621 96.0%	26 4.0%	549 85.4%	94 14.6%
Pool 26	1165 96.7%	40 3.3%	952 76.9%	286 23.1%
Open	487 95.9%	21 4.1%	378 73.4%	137 26.6%
Total	2736 96.3%	104 3.7%	2276 78.9%	608 21.1%

TABLE D3
SIZE OF RECREATION PARTIES FROM ON-SITE INTERVIEWS

AREA	PARTY SIZE				
	1	2	3	4	5+
Pool 24	108 22.9%	173 36.7%	77 16.3%	59 12.5%	73 11.6%
Pool 25	110 17.6%	232 37.2%	112 17.9%	106 17.0%	99 14.8%
Pool 26	195 15.9%	474 38.6%	221 18.0%	207 16.9%	162 10.6%
Open	83 16.3%	180 35.4%	89 17.5%	90 17.7%	78 10.6%
Total	496 16.9%	1059 36.2%	499 17.0%	462 15.8%	412 14.1%

TABLE D4

FIRST TIME EVER VISITORS TO MISSISSIPPI RIVER

AREA	YES	NO
Pool 24	30 6.1%	459 93.7%
Pool 25	33 5.0%	625 95.0%
Pool 26	85 6.8%	1171 93.2%
Open	47 9.0%	472 91.0%
Total	195 6.7%	2727 93.3%

TABLE D5

VISITS PER YEAR TO THE RIVER BY ON-SITE INTERVIEWEES

AREA	FREQUENCY OF VISIT						EVERY OTHER WEEK
	ONCE	TWICE	3 - 6 TIMES	OVER 6 TIMES	WEEKLY	MORE THAN WEEKLY	
Pool 24	48 9.8%	14 2.9%	58 11.9%	269 55.0%	53 10.8%	30 6.1%	16 3.3%
Pool 25	38 5.8%	25 3.8%	61 9.3%	347 52.7%	123 18.7%	47 7.1%	18 2.7%
Pool 26	105 8.4%	86 6.9%	136 10.9%	621 49.6%	194 15.5%	66 5.3%	41 3.7%
Open	94 18.3%	55 10.7%	78 15.1%	201 39.0%	64 12.4%	19 3.7%	4 .8%
Total	285 9.8%	180 6.2%	333 11.4%	1438 49.4%	434 14.9%	162 5.6%	79 2.7%

TABLE D6

LENGTH OF STAY ON THE RIVER

AREA	LENGTH OF STAY					MORE THAN 1 WEEK	LIVE HERE
	0 - 4 HOURS	1/2 - 1 DAY	DAY & NIGHT	2 DAYS AND NIGHTS	3 DAYS- 1 WEEK		
Pool 24	250 51.2%	160 32.8%	10 2.0%	34 7.0%	27 5.5%	4 .8%	2 .4%
Pool 25	262 40.1%	237 36.3%	15 2.3%	74 11.3%	42 6.4%	14 2.1%	9 1.4%
Pool 26	519 41.4%	513 40.9%	54 4.3%	108 8.6%	26 2.1%	16 1.3%	18 1.4%
Open	336 64.7%	146 28.1%	7 1.3%	26 5.0%	4 .8%	0 0	0 0
Total	1367 46.9%	1056 36.3%	86 3.0%	242 8.3%	99 3.4%	34 1.2%	29 1.0%

TABLE D7

TYPE OF VEHICLE USED TO REACH RECREATION SITE

AREA	VEHICLE TYPE						OTHER
	CAR TRUCK OR VAN	CAR WITH TRAILER	CAMPER	BOAT	MOTOR CYCLE		
Pool 24	421 88.6%	8 1.7%	18 3.8%	12 2.5%	7 1.5%	9 1.9%	
Pool 25	566 89.7%	21 3.3%	16 2.5%	18 2.9%	7 1.1%	3 .5%	
Pool 26	1105 89.3%	6 .5%	21 1.7%	51 4.1%	17 1.4%	37 3.0%	
Open	433 83.4%	14 2.7%	7 1.3%	25 4.8%	17 3.3%	23 4.5%	
Total	2525 88.2%	49 1.7%	62 2.2%	106 3.7%	48 1.7%	72 2.5%	

TABLE D8

NUMBER OF VEHICLES IN RECREATION PARTIES OF ON-SITE INTERVIEWEES

AREA	NUMBER OF VEHICLES			
	1	2	3	4 or more
Pool 24	445 90.8%	35 7.1%	6 1.2%	4 .8%
Pool 25	581 88.2%	44 6.7%	12 1.8%	22 3.3%
Pool 26	1135 90.3%	91 7.2%	16 1.3%	17 1.3%
Open	486 93.5%	25 4.8%	4 .8%	5 1.0%
Total	2647 90.4%	195 6.7%	38 1.3%	48 1.6%

TABLE D9
DISTANCE FROM HOME OF ON-SITE INTERVIEWEES

AREA	DISTANCE IN MILES				
	0 - 25	26 - 50	51 - 100	101 - 250	250+
Pool 24	295 60.5%	52 10.7%	105 21.5%	20 4.1%	16 3.3%
Pool 25	268 40.7%	218 33.1%	153 23.2%	10 1.5%	10 1.5%
Pool 26	736 58.7%	417 33.3%	60 4.8%	15 1.2%	26 2.1%
Open	306 58.8%	102 19.6%	45 8.7%	19 3.7%	48 9.2%
Total	1605 54.9%	789 27.0%	363 12.4%	64 2.2%	100 3.4%

TABLE D10

RECREATION ACTIVITIES OF ON-SITE INTERVIEWEES:
ABSOLUTE FREQUENCIES OF PARTICIPATION

Activity	Pool or Segment			Open	Total
	24	25	26		
Cottage Use	9	69	50	5	133
Hardtop Camper	11	25	35	25	96
Tent Camping	10	12	40	9	71
Other Camping	0	0	5	0	5
Canoeing	4	4	4	1	13
Fishing Boat	30	147	100	36	313
Sailboat	2	1	27	7	37
Runabout	71	121	409	63	664
Pontoon Boat	8	7	7	5	27
Cabin Cruiser	31	13	162	18	224
Tour Boat	0	2	3	2	7
Houseboat	13	6	72	10	101
Other Boating	7	6	32	10	55
Loafing/Relaxing	203	293	466	164	1126
Bank Fishing	94	149	150	47	440
Boat Fishing	70	160	206	55	491
Set Line Fishing	2	14	16	5	37
Picnicking	72	125	329	104	630
Water Skiing	54	111	310	43	518
Swimming	35	88	271	36	430
Caving	1	0	10	0	11
Waterfowl Hunting	27	80	23	3	133
Small Game Hunting	6	2	9	1	18
Deer Hunting	7	4	12	3	26
Turkey Hunting	3	1	4	0	8
Target-Trap Shooting	0	2	6	0	8
Other Hunting	2	0	3	1	6
Day Hiking	9	18	51	22	100
Overnight Hiking	1	1	1	3	6
Viewing the River	265	307	484	235	1291

TABLE D10-(CONT'D)

RECREATION ACTIVITIES OF ON-SITE INTERVIEWEES:
ABSOLUTE FREQUENCIES OF PARTICIPATION

Activity	Pool or Segment			Open	Total
	24	25	26		
Four-Wheel Driving	2	5	11	1	19
Motor Cycling	12	14	13	9	45
Snowmobiling	1	1	3	0	5
Bicycling	4	7	56	4	71
Trapping	0	1	0	0	1
Wildlife Viewing	67	73	71	13	224
Rapelling	0	1	7	0	8
Sunbathing	27	51	182	17	277
Horseback Riding	0	1	8	0	9
Cross-Country Skiing	0	0	1	0	1
Other	9	4	36	28	77

TABLE D11

RECREATION ACTIVITIES OF ON-SITE INTERVIEWEES:
PERCENTAGE FREQUENCIES OF PARTICIPATION

Activity	Pool or Segment				Total
	24	25	26	Open	
Cottage Use	1.8%	10.4%	4.0%	1.0%	4.5%
Holiday Camper	2.2	3.8	2.8	4.8	3.3
Tent Camping	2.0	1.9	3.1	1.7	2.4
Other Camping	-	-	.4	-	.2
Canoeing	.8	.6	.3	.2	.4
Fishing Boat	6.1	22.3	7.9	6.9	10.7
Sailboat	.4	.2	2.2	1.4	1.3
Runabout	14.5	18.3	32.5	12.1	22.7
Pontoon Boat	1.6	1.1	.6	1.0	.9
Cabin Cruiser	6.3	2.0	12.9	3.5	7.7
Tour Boat	-	.3	.3	.4	.2
Houseboat	2.6	.9	5.8	1.9	3.4
Other Boating	1.4	.9	2.6	1.9	1.9
Loafing/Relaxing	41.5	44.5	37.0	31.6	38.5
Bank Fishing	19.2	22.7	11.9	9.0	15.0
Boat Fishing	14.2	24.3	16.4	10.6	16.8
Set Line Fishing	.4	2.1	1.3	1.0	1.3
Picnicking	14.7	19.0	26.1	20.0	21.5
Water Skiing	11.0	16.8	24.7	8.3	17.7
Swimming	7.1	13.4	21.5	6.9	14.7
Caving	.2	-	.8	-	.4
Waterfowl Hunting	5.5	12.2	1.8	.6	4.5
Small Game Hunting	1.2	.3	.7	.2	.6
Deer Hunting	1.4	.6	1.0	.6	.9
Turkey Hunting	.6	.2	.3	-	.3
Target-Trap Shooting	-	.3	.5	-	.3
Other Hunting	.4	-	.2	.2	.2
Day Hiking	1.8	2.7	4.0	4.3	3.4
Overnight Hiking	.2	.2	.1	.6	.2
Viewing the River	54.1	46.6	38.5	45.1	44.1

TABLE D11- (CONT'D)

RECREATION ACTIVITIES OF ON-SITE INTERVIEWEES:
PERCENTAGE FREQUENCIES OF PARTICIPATION

Activity	Pool or Segment			Open	Total
	24	25	26		
Four-Wheel Driving	.4%	.8%	.9%	.2%	.6%
Motorcycling	2.4	2.2	1.1	1.7	1.5
Snowmobiling	.2	.2	.2	-	.2
Bicycling	.8	1.1	4.5	.8	2.4
Trapping	-	.2	-	-	0.0
Wildlife Viewing	13.7	11.1	5.7	2.5	7.7
Rapelling	-	.2	.6	-	.3
Sunbathing	5.5	7.7	14.5	3.1	9.5
Horseback Riding	-	.2	.6	-	.3
Cross-Country	-	-	.1	-	0.0
Skiing	-	-	.1	-	0.0
Other	1.8	.6	2.8	5.4	2.6

TABLE D12

ABSOLUTE FREQUENCY COUNTS:
USER SUGGESTED IMPROVEMENTS FROM ON-SITE INTERVIEWEES

Improvement	Pool or Segment			Open	Total
	24	25	26		
More Sand Bars	15	5	29	3	52
More Public Access	20	42	46	12	120
Improve Boat Ramps	15	21	8	10	54
More Control of Water Levels	6	88	29	7	130
Trash Cans	4	1	8	1	14
Remove Logs	1	2	4	2	9
More Dredging	3	16	23	2	44
Pickup Trash	16	10	39	23	88
More Equipment Rental	0	4	5	0	9
More Toilet Faci- lities	29	15	39	17	100
Protection from Vandals	2	1	2	0	5
Tennis Courts	0	0	2	0	2
Protect Shoreline	1	0	2	1	4
More Parks	1	1	7	6	15
Improve Toilet Facilities	0	0	9	0	9
More Gas Stations	3	6	31	20	60
More Boat Ramps	8	15	38	16	77
More of All Facilities	2	0	3	2	7
Warn of Underwater Hazards	0	0	1	0	1
Motels	0	0	2	0	2
Mosquito Control	2	1	0	2	5
Improve Hunting	1	2	0	0	3
More Development of Campgrounds	0	2	2	9	13
Better Maintenance	4	2	0	0	6
More Beaches	2	3	20	5	30
Pumpout Stations for Holding Tanks	2	0	1	0	3
More Docks	3	5	19	6	33
Improve Roads	2	7	4	3	16
Mark Rock Dikes	1	2	4	0	7
More Campgrounds	8	23	12	2	45

TABLE D12- (CONT'D)

ABSOLUTE FREQUENCY COUNTS:
USER SUGGESTED IMPROVEMENTS FROM ON-SITE INTERVIEWEES

Improvement	Pool or Segment			Open	Total
	24	25	26		
Places to Eat	8	2	34	2	46
More Marinas	8	12	8	6	34
Improve Water Quality	11	1	25	9	46
More Harbors	0	1	10	1	12
Raise Water Level	0	9	14	1	24
Improve Boat Docks	0	2	2	4	8
More Picnic Tables	5	5	14	3	27
More Information About Facilities	0	1	0	0	1
More Bike Paths	0	0	6	0	6
Lower Water Level	1	2	1	1	5
More Parking	1	1	0	1	3
Less Barge Traffic	0	1	0	1	2
More Law Enforcement	1	1	1	1	4
Ball Fields	1	0	0	2	3
Mile Markers on River	0	0	1	0	1
Better Signing	0	0	2	4	6
More Benches	0	0	1	2	3
Drinking Water	2	1	1	2	6
Showers	0	0	0	1	1
More Bridges	0	0	1	1	2
Interpretation	0	1	1	1	3
More Trails	2	0	0	1	3
No Comment	298	343	747	324	1712
Total	490	659	1259	520	2928

TABLE D13

FREQUENCY PERCENTAGES:
USER SUGGESTED IMPROVEMENTS FROM ON-SITE INTERVIEWEES

Improvement	Pool or Segment			Open	Total
	24	25	26		
More Sand Bars	3.1%	.8%	2.3%	6%	1.8%
More Public Areas	4.1	6.4	3.7	2.3	4.1
Improve Boat Ramps	3.1	3.2	.6	1.9	1.8
More Control of Water Levels	1.2	13.4	2.3	1.3	4.4
Trash Cans	.8	.2	.6	.2	.5
Remove Logs	.2	.3	.3	.4	.3
More Dredging	.6	2.4	1.8	.4	1.5
Pickup Trash	3.3	1.5	3.1	4.4	3.0
More Equipment Rental	-	.6	.4	-	.3
More Toilet Fac- ilities	5.9	2.3	3.1	3.3	3.4
Protection from Vandals	.4	.2	.2	-	.2
Tennis Courts	-	-	.2	-	.1
Protect Shoreline	.2	-	.2	.2	.1
More Parks	.2	.2	.6	1.2	.5
Improve Toilet Facilities	-	-	.7	-	.3
More Gas Stations	.6	.9	2.5	3.8	2.0
More Boat Ramps	1.6	2.3	3.0	3.1	2.6
More of All Faci- lities	.4	-	.2	.4	.2
Warn of Underwater Hazards	-	-	.1	-	.1
Motels	-	-	.2	-	.1
Mosquito Control	.4	.2	-	.4	.2
Improve Hunting	.2	.3	-	-	.1
More Development of Campgrounds	.8	.3	.2	1.7	.4
Better Maintenance	-	.3	-	-	.2
More Beaches	.4	.5	1.6	1.0	1.0
Pumpout Stations for Holding Tanks	.4	-	.1	-	.1
More Docks	.6	.8	1.5	1.2	1.1
Improve Roads	.4	1.1	.3	.6	.5
Mark Rock Dikes	.2	.3	.3	-	.2
More Campgrounds	1.6	3.5	1.0	.4	1.5

TABLE D13- (CONT'D)

FREQUENCY PERCENTAGES:
USER SUGGESTED IMPROVEMENTS FROM ON-SITE INTERVIEWEES

Improvement	Pool or Segment			Open	Total
	24	25	26		
Places to Eat	1.6%	.3%	2.7%	.4%	1.6%
More Marinas	1.6	1.8	.6	1.2	1.2
Improve Water Quality	2.2	.2	2.0	1.7	1.6
More Harbors	-	.2	.8	.2	.4
Raise Water Level	-	1.4	1.1	.2	.8
Improve Boat Docks	-	.3	.2	.8	.3
More Picnic Tables	1.0	.8	1.1	.6	.9
More Information					
About Facilities	-	.2	-	-	.1
More Bike Paths	-	-	.5	-	.2
Lower Water Level	.2	.3	.1	.2	.2
More Parking	.2	.2	-	.2	.1
Less Barge Traffic	-	.2	-	.2	.1
More Law Enforcement	.2	.2	.1	.2	.1
Ball Fields	.2	-	-	.4	.1
Mile Markers on River	-	-	.1	-	.1
Better Signing	-	.2	.2	.8	.2
More Beaches	-	-	.1	.4	.1
Drinking Water	.4	.2	.1	.4	.2
Showers	-	-	-	.2	.1
More Bridges	-	-	.1	.2	.1
Interpretation	-	.2	.1	.2	.1
More Trails	.4	-	-	.2	.1
No Comment	60.8	52.0	59.3	62.3	58.5

APPENDIX E
SUPPLEMENTARY MATERIALS FROM TELEPHONE SURVEY

APPENDIX E

TABLE E1

COMMUNITIES INCLUDED IN TELEPHONE BOOKS USED FOR TELEPHONE SURVEY

Quincy, including Burton, Columbus, Fowler, Liberty, Marblehead,
Payson, Plainville, Illinois

Carbondale, including Grand Tower, DeSoto, Murphysboro, Illinois
Alton, including Wood River, Illinois

East St. Louis, Illinois
Alorton, Brooklyn, Centerville, Fairview Heights, Medora, Sauget,
Cahokia, Caseyville, Chesterfield, Fieldon, National City, Washington
Park, Batchtown, Brussels, Fairmont City, Heddick, Rock Bridge.

Louisiana, including Annada, Ashburn, Ashley, Bowling Green,
Clarksville, Curryville, Cyrene, Edgewood, Evlia, Frankford,
Middletown, New Hartford, Payneville, St. Clement, Missouri

Festus, including DeSoto, Crystal City, Antonia, Cedar Hill, Herculanum,
Hillsboro, Imperial, Otto, Richwood, Ware, Missouri

Cape Girardeau, including Jackson, Oak Ridge, Scott City, Illmo, Kelso,
Commerce, Missouri and McClure, Illinois

Canton including Ewing, LaGrange, Lewiston, Monticello, Palmyra, West
Quincy, Missouri

St. Charles, including Portage des Sioux, Weldon Springs, Missouri

St. Louis, Missouri

Affton, Allenton, Antonia, Arnold, Ballwin, Barnhart, Bellefontaine
Neighbors, Bel-Nor, Bel-Ridge, Bella Villa, Bellerive, Berdell Hills,
Berkeley, Beverly Hills, Black Jack, Breckenridge Hills, Brentwood,
Bridgeton, Bridgeton Terr., Burke City, Byrnesville, Calverton Park,
Carsonville, Castlewood, Catawissa, Cedar Hill, Champ, Charlack, Chester-
field, Clarkson Valley, Clayton, Com. Fire Prot. Dist., Cool Valley,
Country Club Hills, Country Life Acres, Crescent, Crestwood, Creve Coeur,
Creve Couer Beach, Crystal Lake Pk., Dellwood, Des Peres, Dittmer,
Hillsdale, House Springs, Edmundson Village, Ellisville, Eureka,
Fenton, Ferguson, Fernglen, Flordell Hills, Florissant, Frontenac,
Gardenville, Glasgow Village, Glen Echo Park, Glencoe, Glendale,
Grantwood, Gray Summit, Greendale, Grover, Grubville, Hanley Hills,
Hazelwood, High Ridge, Huntleigh, Jefferson County, Jennings, Kimmswick,
Kinloch, Kirkwood, Labadie, Ladue, Lakeshire, Lakeside, Lemay, Mackenzie,
Manchester, Maplewood, Marlborough, Mary Ridge Village, Maryland Hts.,
Maxville, Meacham Park, Mehlville, Moline, Moline Acres, Morse Mill,
Murphy, Normandy, Northwoods, Norwood Court, Oakland, Oakville, Olivette,
Otto, Overland, Pacific, Pagedale, Pasadena Hills, Pasadena Park,
Painvle-Brgtn Terr. Fire Prot. Dist., Peerless Park, Pine Lawn, Pond,
Richmond Hts., Riverview, Robertson, Robertson Fire Prot. Dist., Roberts-
ville, Rock Community, Rock Hill, St. Albans, St. Ann, St. George,
St. John, St. Louis, St. Peters, Sappington, Schuermann Hts., Shady
Valley, Sherman, Shrewsbury, Spanish Lake, Springdale, Sunset Hills,
Sycamore Hills, Times Beach, Town & Country, Twin Oaks, University City,

Uplands Park, Valley Park, Velda Village, Velda Village Hills, Villa Ridge, Vinita Park, Vinita Terrace, Warson Woods, Webster Groves, Wellston, West Alton, West Overland, Westwood, Wilbur Park, Winchester, Woodson Terr.

Charlestown, East Prairie, Wyatt, Missouri

Hannibal including Center, Missouri

Ste. Genevieve including Bloomsdale, St. Marys, Missouri and Kaskaskia, Illinois.

Elsberry, Missouri

Caruthersville including Hayti, Braggadocio, Deering, Wardell, Missouri

New Madrid including Lilbourn, Marston, Missouri

Perryville including Longtown, Old Appleton, Friedham, Altenburg, Frohna, Farrar, Pocahontas, New Wells, Missouri

Portageville including Marston, Wardell, Missouri

Fielden, Illinois

Harrisonville, including Waterloo, Illinois

Adams, including Golden, Augusta, Chambersburg, Palana, Fishhook, Hersman, Lima, Loraine, Meneton, Meyer, Mindale, Plymouth, Ursa, Bowen, Burton, Camp Point, Columbus, Clayton, Fowler, Liberty, Marblehead, Mt. Sterling, Payson, Plainville, Quincy, Timewell, Versailles, Illinois

Cairo including Mound City, Mounds, Olmsted, Illinois

Grafton, Olive Branch, Tumms, Thebes, Illinois

Pittsfield including Barry, Baylis, Griggsville, Holt, Kinderhook, Milton, Nebo, New Canton, Pearl, Perry, Pleasant Hill, Rockport, Illinois

Jerseyville including Dow, Hamburg, Hardin, Kampsville, Illinois

Note: Please note that spelling and abbreviations used under the St. Louis, Missouri area are taken directly from source telephone books.

TABLE E2
TELEPHONE SURVEY:
IMPROVEMENTS TO RIVER RECREATION
SITES AND FACILITIES

IMPROVEMENT	TOTAL SURVEY		RANDOM TELEPHONE SURVEY		DUAL SURVEY	
	FREQ.	%	FREQ.	%	FREQ.	%
No comment	2505	76.5%	2304	78.0%	201	63.8%
More boat ramps	79	2.4	52	1.8	27	8.4
More picnic areas	39	1.2	35	1.2	4	1.2
Better access	62	1.9	38	1.3	24	7.5
New locks and dams	4	.1	4	.1	0	-
More swimming	16	.5	14	.5	2	.6
More eating places	16	.5	16	.5	0	-
Clean up river	307	9.4	290	9.8	17	5.3
Bring back "Admiral"	76	2.3	74	2.5	2	.6
Better flood control	4	.1	3	.1	1	.3
More parks	45	1.4	43	1.5	2	.6
More docks	25	.8	20	.7	5	1.6
More boat rentals	4	.1	4	.1	0	-
More camping areas	19	.6	16	.5	3	.9
More tour boats	1	0.0	1	0.0	0	-
More control of water levels	29	.9	17	.6	12	3.7
More parking	5	.2	5	.2	0	-
More toilets	12	.4	1	0.0	11	3.4
Wheelchair access	2	.1	2	.1	0	-
More trash cans	4	.1	4	.1	0	-
More developed campgrounds	2	.1	2	.1	0	-
More gas stations	6	.2	4	.1	2	.6
Clear brush	4	.1	3	.1	1	.3
More sand bars	9	.3	3	.1	6	1.9
Total Respondents to Question	3275	100.0%	2955	100.0%	320	100.0%

TABLE E3
TELEPHONE SURVEY:
CONDITIONS THAT WOULD INCREASE PARTICIPATION

CONDITION	TOTAL SURVEY		RANDOM TELEPHONE		DUAL SURVEY	
	FREQ.	%	FREQ.	%	FREQ.	%
None	2733	84.4%	2450	84.0%	282	88.2%
Less development	12	.4	12	.4	0	-
Clean up river	266	8.2	246	8.4	19	5.9
Boat rentals	7	.2	7	.2	0	-
Better security	17	.5	16	.5	1	.3
More swimming areas	10	.3	9	.3	1	.3
More camping areas	11	.3	8	.3	3	.9
More parks	23	.7	23	.8	0	-
Bring back "Admiral"	32	1.0	32	1.1	0	-
Better information	24	.7	24	.8	0	-
If owned a boat	7	.2	7	.2	0	-
Reduced barge traffic	41	1.3	33	1.1	8	2.5
Lifeguard	5	.2	5	.2	0	-
More tour boats	2	.1	2	.1	0	-
More boat docks	7	.2	7	.2	0	-
Less police	2	.1	2	.1	0	-
More toilets	4	.1	4	.1	0	-
Better access	18	.6	18	.6	0	-
Stabilize water levels	14	.4	9	.3	5	1.6
Total Respondents to Question	3233	100.0%	2914	100.0%	319	100.0%

TABLE E4
TELEPHONE SURVEY:
REASONS GIVEN FOR USING THE RIVER
"MORE" OR "LESS"

REASON	TOTAL SURVEY		RANDOM TELEPHONE SURVEY		DUAL SURVEY	
	FREQ.	%	FREQ.	%	FREQ.	%
No longer own boat	33	11.7%	31	11.4%	2	20.0%
Too old	113	40.1	113	41.5	0	-
Handicapped	5	1.8	5	1.8	0	-
Too dangerous	11	3.9	11	3.9	0	-
Children getting old	9	3.2	7	2.6	2	20.0
Bought boat	21	7.4	19	7.0	2	20.0
Moving away	17	6.0	17	6.3	0	-
Just moved into area	4	1.4	4	1.5	0	-
Boat at a lake	4	1.4	3	1.1	1	10.0
Too busy	8	2.8	7	2.6	1	10.0
Will be working there	2	.7	2	.7	0	-
More spare time	20	7.1	19	7.0	1	10.0
More friends doing it	2	.7	2	.7	0	-
Gas too expensive	5	1.8	4	1.5	1	10.0
Cost too much	3	1.1	3	1.1	0	-
Dirty	12	4.3	12	4.4	0	-
No time	5	1.8	5	1.8	0	-
Sick	8	2.8	8	2.9	0	-
Total Respondents To Question	282	100.0%	272	100.0%	10	100.0%

*Response to this question by those who participated in both on-site and telephone surveys was very limited and should not be used in any analysis.

TABLE E5

COMPARATIVE PARTICIPATION DURING PAST 12 MONTHS:
INTERVIEWEES IN TOTAL, TELEPHONE INTERVIEWEES ONLY, AND
INTERVIEWEES OF BOTH TELEPHONE AND ON-SITE SURVEY

Activity	Telephone Total Sample	Random Telephone	Dual Survey
Cottage Use	3.0%	.2%	13.4%
Hardtop Camper	3.9	2.8	14.6
Tent Camping	4.0	2.7	16.2
Other Camping	.7	.7	.9
Canoeing	1.3	1.3	.9
Fishing Boat	8.4	6.6	25.9
Sailboat	1.3	1.3	1.9
Runabout	11.1	8.6	35.8
Pontoon Boat	1.6	1.2	5.6
Cabin Cruiser	2.2	1.6	7.8
Tour Boat	2.5	2.7	.6
Houseboat	1.9	1.7	4.0
Other Boating	2.1	2.2	.9
Loafing/Relaxing	18.1	11.1	85.4
Bank Fishing	13.5	11.2	36.1
Boat Fishing	14.3	10.2	54.8
Set Line Fishing	2.6	2.1	7.2
Picnicking	21.2	16.0	71.0
Water Skiing	12.9	8.9	52.0
Swimming	15.3	11.0	57.0
Caving	.6	.6	2.2
Waterfowl Hunting	3.3	2.3	12.5
Small Game Hunting	2.5	1.7	10.3
Deer Hunting	1.5	1.1	5.6
Turkey Hunting	.6	.5	.6
Target-Trap Shooting	.2	.3	0.0
Other Hunting	-	-	-
Day Hiking	9.5	6.2	42.1
Overnight Hiking	.3	.3	.6
Viewing the River	29.3	23.0	91.0

TABLE E5-(Cont'd)

COMPARATIVE PARTICIPATION DURING PAST 12 MONTHS:
 INTERVIEWEES IN TOTAL, TELEPHONE INTERVIEWEES ONLY, AND
 INTERVIEWEES OF BOTH TELEPHONE AND ON-SITE SURVEY

Activity	Telephone Total Sample	Random Telephone	Dual Survey
Four-wheel Driving	1.8%	1.5%	5.0%
Motorcycling	1.4	1.1	4.4
Snowboling	.6	.5	1.9
Bicycling	3.7	2.5	15.0
Trapping	.7	.5	2.8
Wildlife Viewing	8.9	5.9	38.0
Rapelling	.9	.7	2.5
Sunbathing	11.3	6.5	57.6
Horseback Riding	1.5	1.2	4.7
Cross-Country Skiing	.3	-	2.8
Other	3.3	3.7	.3
Total Respondents to Question	3,438	3,117	321

TABLE E-6

FAVORITE OUTDOOR RECREATION AREAS
OF TELEPHONE SURVEY RESPONDENTS

AREA	FREQUENCY	PERCENT
Area Lakes and Reservoirs	632	26.0%
Area Parks and Forests	548	22.5
On the Mississippi River	547	22.5
Other Area Rivers	303	12.4
St. Louis Attractions	93	3.8
Private Residences	92	3.8
Non-Area Parks and Forests	90	3.7
Private Clubs	72	3.0
Arch and Museum	26	1.1
Other Area Cities	24	1.0
Other Non-Area Cities	4	.2
Non-Area Lakes and Reservoirs	3	.1
Non-Area Rivers	1	.0
Total Respondents to Question	2,435	100.1%

APPENDIX F
POPULATION PROJECTIONS

TABLE F-1

POPULATION PROJECTIONS FOR ILLINOIS AND
MISSOURI COUNTIES OF SERVICE AREA

<u>Illinois Counties</u>	<u>1980*</u>	<u>1990**</u>	<u>2000**</u>
Calhoun	5,867	6,043	6,224
Jersey	20,538	21,225	22,051
Randolph	35,566	36,756	38,186
Jackson	61,521	63,581	66,055
Union	16,851	17,415	18,093
Alexander	12,264	12,674	13,167
Greene	16,661	17,219	17,889
Macoupin	49,384	51,037	53,023
Montgomery	31,686	32,746	34,010
Bond	16,224	16,767	17,419
Washington	15,472	15,990	16,612
Perry	21,714	22,441	23,314
Franklin	43,201	44,647	46,384
Williamson	56,538	58,430	60,703
Johnson	9,624	9,946	10,333
Pulaski	8,840	9,136	9,491
Hancock	23,877	24,676	25,636
Adams	71,622	74,019	76,899
Pike	18,896	19,528	20,288
Madison	247,671	255,960	265,918
St. Clair	265,469	274,354	285,028
Monroe	20,117	20,790	21,599
Schuyler	8,365	8,645	8,981
Brown	5,411	5,592	5,810
Scott	6,142	6,348	6,595
Clinton	32,617	33,709	35,020
Sub Total	1,122,138	1,159,674	1,204,728

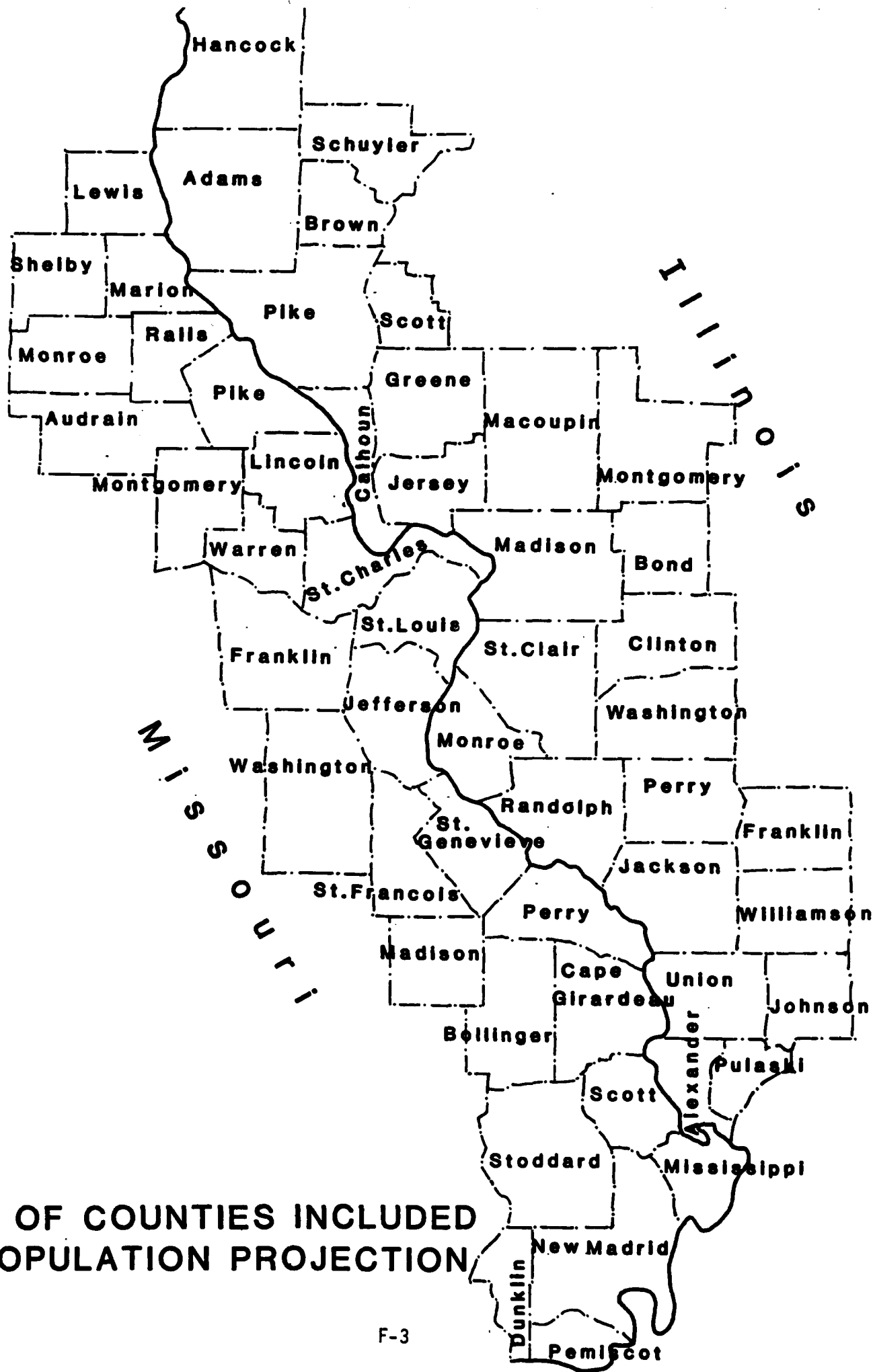
TABLE F-1 (Cont'd)

POPULATION PROJECTIONS FOR ILLINOIS AND
MISSOURI COUNTIES OF SERVICE AREA

<u>Illinois Counties</u>	<u>1980*</u>	<u>1990**</u>	<u>2000**</u>
Lewis	10,901	11,331	11,655
Marion	28,638	29,769	30,619
Ralls	8,911	9,263	9,528
Pike	17,568	18,262	18,784
Lincoln	22,193	23,069	23,728
St. Charles	143,455	149,120	153,380
St. Louis (City & County)	1,427,900	1,484,288	1,526,691
Jefferson	146,814	152,612	156,972
St. Genevieve	15,180	15,779	16,230
Perry	16,784	17,447	17,945
Cape Girardeau	58,837	61,160	62,907
Scott	39,647	41,213	42,390
Mississippi	15,726	16,347	16,814
Shelby	7,826	8,135	8,367
Monroe	9,716	10,100	10,389
Audrain	26,458	27,503	28,289
Montgomery	11,537	11,993	12,336
Warren	14,900	15,488	15,930
Franklin	71,233	74,046	76,161
Washington	17,983	18,693	19,227
St. Francois	42,600	44,282	45,547
Madison	10,725	11,149	11,468
Bollinger	10,301	10,708	11,014
Stoddard	29,009	30,155	31,016
New Madrid	22,945	23,851	24,532
Pemiscot	24,987	25,974	26,716
Dunklin	36,324	37,758	38,837
Sub Total	2,289,098	2,379,495	2,447,472
Illinois and Missouri Total	3,411,236	3,539,169	3,652,200

* 1980 U.S. Census count provided by St. Louis District, Corps of Engineers

** Provided by St. Louis District Corps of Engineers from OBERS Projections,
1980 Series: Illinois-Volume 7, Missouri-Volume 6.



**MAP OF COUNTIES INCLUDED
IN POPULATION PROJECTION**

APPENDIX G
DEFINITIONS

DEFINITIONS

Activity-Days: Any portion of a day in which a person participates in a recreation activity. As an example, a recreationist who engages in picnicking and bank fishing on a given day generates two activity-days.

Dual Survey Respondents: Respondents who participated in both the on-site and telephone surveys

GREAT: Great River Environmental Action Team

Great III: That portion of the Mississippi River between Lock and Dam 22 (River Mile 301.3) and the mouth of the Ohio (River Mile 0.0).

On-Site Survey: A personal interview survey conducted at sample sites in the study area.

Open Segment: That portion of the Mississippi River between Lock and Dam 26 (River Mile 202.9) and the mouth of the Ohio River (River Mile 0.0).

Pool 24: That portion of the Mississippi River between Lock and Dam 22 (River Mile 301.3) and Lock and Dam 24 (River Mile 273.4).

Pool 25: That portion of the Mississippi River between Lock and Dam 24 (River Mile 273.4) and Lock and Dam 25 (River Mile 241.5).

Pool 26: That portion of the Mississippi River between Lock and Dam 25 (River Mile 241.5) and Lock and Dam 26 (River Mile 202.9).

Random Telephone Respondents: The randomly selected respondents to the telephone survey.

River Mile: A geographic reference scheme indicating the number of miles upstream on the Mississippi beginning with River Mile 0.0 at the mouth of the Ohio River.

Telephone Survey: An interview survey conducted by telephone for a defined service area.

Visitor-Day: Any portion of a day in which a person visits a recreation site and participates in some recreation activity. For example, a recreationist visiting a park on a given day would generate one visitor-day regardless of how many activities were observed.

APPENDIX H
Bibliography

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- _____. "Social Carrying Capacity and User Satisfaction: An Experiential Function." Leisure Sciences 1(3), 1978.
- _____. "Upper Mississippi Dredged Material Disposal Site Recreational User Assessment." Report to the Great I RWG., 1978.
- Becker, R.H., B.J. Niemann, and W.A. Gates. "User and Resource Conditions of the Lower St. Croix Riverway." Report to the Minnesota/Wisconsin Boundary Area Commission, 1979.
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- Murray, J.B. Appalachian Trail Users in the Southern National Forests. SE-116 State East Forest Experiment Station, Asheville, NC 1974.
- Noe, F.P., G. Hampe, and L. Malone. Outdoor Recreation Patterns and Preferred Scenes Along a Parkway. Unpublished paper presented at Leisure Research Symposium, Miami, FL, October 14, 1978.
- Schreyer, R. and J. Roggenbuck. The Influence of Experience Expectations on Crowding Perception and Social-Psychological Carrying Capacities. Leisure Sciences 1 (40), 1978.
- Snedecor, G., and W. Cochran. Statistical Methods. Ames, Iowa: The Iowa State University Press, 1973.
- State of Illinois, Department of Conservation. Outdoor Recreation in Illinois. Springfield, Illinois. December, 1978.
- Upper Mississippi River Conservation Committee. Recreation Facility Inventory, 1978.

APPENDIX I

Work Group and Resumes of Principal Investigators

GREAT RIVER RESOURCE MANAGEMENT STUDY
GREAT III
RECREATION WORK GROUP MEMBERSHIP

Ms. Judy Deel
Office of Historic Preservation
Department of Natural Resources
P.O. Box 176
Jefferson City, Missouri 65102

Mr. George Fleener
Department of Conservation
Research Center
1110 College Avenue
Columbia, Missouri 65201

Mr. A. Stephen Weithman
Fisheries Research Biologist
Department of Conservation
1110 College Avenue
Columbia, Missouri 65201

Mr. Jim Farrell
St. Louis County Parks and
Recreation Department
7900 Forsyth
Clayton, Missouri 63105

Mr. Edward R. Crow
Southwestern Illinois Metropolitan
and Regional Planning Commission
203 West Main Street
Collinsville, Illinois 62234

Mr. R. Roger Pryor, Director
Missouri Natural Area Survey
6267 Delmar
St. Louis, Missouri 63130

Mr. James K. Young
Conservation Federation of Missouri
116 South West Street
Perryville, Missouri 63775

Mr. Bill Kloppe
1339 Selma
St. Louis, Missouri 63119

Mr. Greg Iffrig
Natural Areas Coordinator
Department of Natural Resources
P.O. Box 176
Jefferson City, Missouri 65102

Mr. Jerry McDonald
Illinois Department of Conservation
Region IV Office
34 West Broadway
Alton, Illinois 62002

Mr. T. Scott Bates
Mark Twain National Wildlife Refuge
Great River Plaza
311 North Fifth Street, Suite 100
Quincy, Illinois 62301

Mr. Dick R. Little
Resource Planner
Illinois Department of Conservation
603 William G. Stratton Building
Springfield, Illinois 62706

Ms. Kay Salazar
National Park Service
Denver Federal Center
655 Parfet Street, P.O. Box 25287
Denver, Colorado 80225

Ms. Betty Wilson
League of Women Voters
Three Robin Hill Lane
Ladue, Missouri 63124

Mr. Ed Glaser
Missouri Department of Conservation
2901 North Ten Mile Drive
Jefferson City, Missouri 65101

RESUME

Robert H. Becker, Director
Energy and Resource Development Institute and
Associate Professor, College of Forest and Recreation Resources
Clemson University
Clemson, South Carolina 29631
(803) 656-2194

Career Objectives

Leadership position in research management with some teaching opportunities in quality educational institutions. Major career commitment in the following areas:

1. Improve and upgrade the quality of interdisciplinary research in the areas of social use of nature areas, and natural resource allocation and management;
2. Improved linkage between university research and public agency program development and planning;
3. Innovative research funding/management to reduce program dependence on general tax-based funds;
4. Innovations and redefinition of institutions during adversity;
5. History of conservation as a political movement.

Past Experience and Background

Demonstrated skill in research management and development through acquisition of approximately two million dollars in project support. Have developed and implemented complex interdisciplinary programs in the areas of unified river basin management, impacts of natural resource development, and outdoor recreation behavior. These programs required the information and administration of a consortium of scientists from Wisconsin, Minnesota, Illinois, and Iowa. The program is still active and still influencing resource allocation decisions in the Upper Mississippi River Basin. Have developed methods and processes for citizen involvement in resource allocation and management decisions. Clear-cutting, channel dredging, and establishment of criteria for environmental impact statements (EIS) are topics of past research in public participation.

Have developed contract work with federal and state government agencies as well as private industry. Have a reputation for producing timely, accurate, and cost effective research. Products and techniques developed include aerial estimation of recreation river use, and spatial use sampling procedures. Both were well received and implemented and have received agency commendation. Have

developed grant awards from federal government and private foundations. Have developed innovative research funding mechanisms through use of revolving funds, endowment accounts, and information distribution syndicates. These mechanisms were designed to provide a source of funds for research topics that may not have immediate market source but exhibit future promise.

Current University Activities

Director-The Energy and Resource Development Institute. The Institute is a regional program, affiliated with six major southeast universities and four federal land management agencies. Principal investigator-Housing/Energy Research Program, a program which develops innovations in design, mechanical systems and site development for energy efficient low to middle priced homes. Homes are constructed, studied, monitored for performance, and then sold. Sales proceeds underwrite future housing research and other Institute programs. Each house carries approximately 20 detailed studies. Coordinator of 10 projects within the Institute. These include Marketing and Use of Wood as an Energy Resource, Consequences to the Regional Tourist Industry as a Result of Fuel Availability and Cost, and Assessing Resource Valuation by Integrating Net Energy Costs into Benefit/Cost Calculations.

Professional Activities

Technical advisor to the following: The University of Alaska Experiment Station Project entitled, "Representative Rivers: An Experimental Recreation Research Program for Alaska"; and U. S. Army Corps of Engineers' projects, "Lockage Assessment on the Upper Mississippi River," "Assessment of Benefits from Increased Discharges from the Allegheny Reservoir," "Assessing Recreational Use on the Great River projects, Upper Mississippi River." Have provided expert court testimony on river management issues. Served on numerous national program committees. Presented over 20 major workshops and formal, invited papers. Member of several professional and honor societies and reader for Journal of Forestry, Journal of Leisure Research, and Review of Regional Studies.

Employment History

1980 - Current	Clemson University: Director, Energy and Resource Development Institute; Associate Professor, College of Forest and Recreation Resources.
1976 - 1980	University of Wisconsin-Madison: Associate Director and Research Social Scientist, Wisconsin Water Resources Center (1977-1980); Assistant Professor, Department of Forestry, (1976-1980).
1971 - 1976	University of Maryland: Research Associate, Maryland Agricultural Experiment Station, Instructor Department of Recreation, University of Maryland (1973-1976). Graduate Assistant, Department of Recreation, University of Maryland (1971-1973).
1970 - 1973	Private Business: Planner/Consultant Multidisciplinary Associates, (MdA) Washington, D.C. office.

1966 - 1970

The Pennsylvania State University: Research and Computer Technician
for Dr. E. L. Bergman, Department of Horticulture.

Education

B.S.	The Pennsylvania State University	1970
M.A.	University of Maryland Thesis: Gifford Pinchot: His Role in the National Conservation Commission of 1908.	1973
Ph.D.	University of Maryland Dissertation: Social Carrying Capacity of the Savage River State Forest: A User Density Function.	1976

Selected Publication

- 1974 Becker, R. H. and R. O. Ray. "Accessibility: An Application of the New Technology." Therapeutic Recreation Journal, Vol. 8, No. 4.
- 1976 Becker, R. H. "Computer Visualizations as Aids to Forest Recreation Management." Journal of Forestry, Vol. 74, No. 12.
- 1978 Becker, R. H. "Social Carrying Capacity and User Satisfaction: An Experiential Function." Leisure Sciences, Vol. 1, No. 3.
- 1978 Becker, R. H., B. J. Niemann, and W. A. Gates. "Mapping Social Space" in Mullins, D. (ed.). Computer Applications in the Recreation and Parks Field, Arlington, Virginia: N.R.P.A.
- 1979 Becker, R. H. "Travel Computability on the Upper Mississippi River." Journal of Travel Research, Vol. 18, No. 1.
- 1979 Becker, R. H. "Assessing Visitor Spatial Demand Through Forest User Density Preferences: Toward a Social Carrying Capacity Model." Linn, R. M. (ed.). First Conference on Scientific Research in the National Parks, U. S. Department of Interior, National Park Service Transaction Series, No. 5.
- 1980 Becker, R. H. "Dredged Spoil: An Identity Not a Terminology Problem." Journal of Environmental Education, Vol. 12, No. 1.
- 1980 Becker, R. H., W. A. Gates, and B. J. Niemann. "Establishing Representative Sample Designs with Aerial Photographic Observation." Leisure Sciences, Vol. 3, No. 3.
- 1980 Becker, R. H., B. J. Niemann, and W. A. Gates. "Management of the Lower St. Croix River: Application of an Integrated Set of Social and Resource Assessment Methods" in Elsner and Smardon (ed.). Our National Landscape. U. S. Forest Service, Berkeley, California, PSW-35.

- 1981 Becker, R. H. "User Reactions to Wild and Scenic River Designation." Water Resources Bulletin, Vol. 17, Nov. 4.
- 1981 Becker, R. H. "Displacement of Recreation Users Between the Lower St. Croix and Upper Mississippi River." Journal of Environment Management, Vol. 13, No. 4.
- 1982 Becker, R. H. and Alan Jubenville. "Forest Recreation Management" Chapter in R. Young Introduction To Forest Science. John Wiley and Sons, Inc.: New York.
- 1982 Bonnicksen, T. M. and R. H. Becker. "Assigning Priorities for Environmental Impact Studies: An Interdisciplinary Approach." Environmental Management. (Accepted, in Press.)

Alan R. Everson
1-30 Agriculture Building
University of Missouri
Columbia, Missouri 65211

Personal: Alan R. Everson

PII Redacted

Education:

Ph.D.	1978	Texas A&M University, Recreation and Resource Development
M.S.	1967	University of Michigan, Forestry (Outdoor Recreation Interpretation)
B.S.	1965	Iowa State University, Forestry- Outdoor Recreation
Manson Community High School, 1961, Manson, Iowa		

Employment:

1977 - present	Associate Professor, Outdoor Recreation and Land Use Planning, School of Forestry, Fisheries and Wildlife, University of Missouri, Columbia, Missouri
1969-1977:	State Outdoor Recreation Planner, Colorado Parks and Outdoor Recreation (Formerly Colorado Game, Fish and Parks). (During this time, while working for CPOR, was Visiting Lecturer at Texas Tech University; and held special appointment to Graduate Faculty at Colorado State University; was on the Short Course Faculty at the University of Colorado and at Texas A&M University).
1969:	Seasonal Naturalist, Rocky Mountain National Park
1968:	Director of Field Services, Rocky Mountain Center for Environment.
1967-1968:	Research Assistant, Texas A&M University
1966-1967:	Recreation Resource Specialist, Bureau of Outdoor Recreation (later Heritage Conservation Recreation Service).

1965-1966:	Teaching Assistant, University of Michigan
1965:	Interpretive Specialist, Iowa Conservation Commission
1964:	Sporting Goods Sales, Yosemite Park & Curry Company
1963:	Forest Researcher, Royal Danish Agricultural College
1962:	Crew Chief, Arapaho National Forest

Membership:

Society of American Foresters
 National Recreation and Park Association
 American Planning Association
 Xi Sigma Pi (Forestry Professional, Charter Member, Iowa State Chapter).
 Phi Mu Alpha Sinfonia (Music Professional)
 Farm House Fraternity (Agriculture Social)

Honors:

Advanced Curriculum Scholarship - 1963, 1964
 Carlton-McCarron Scholarship - 1966
 Selected for Intergovernmental Career Development Program - 1970
 International Award, American Association for Conservation Information - 1971
 Gamma Sigma Delta (Agriculture Scholastic)
 Phi Kappa Phi (Scholastic)

Courses Presently Taught:

FFW 320 - Recreation Land Management, (3 hour)
 Outdoor recreation management for the forest land manager. Planning, budgeting, organization, and development included.

- FFW 340 - Advanced Recreation Land Management (3 hour)
Managing wilderness resources, managing rivers for recreational use. Study includes "public participation" in management.
- FFW 361 - Outdoor Recreation Fieldtrip (1 hour)
One week intensive field study of diverse outdoor recreation managers, and the areas under management.
- FFW 301 - Special Outdoor Recreation Management (2 or 3 hours)
Managing resources for caving, orienteering, cross-country skiing, rock climbing and floating.
- FFW 391 - Land Use Planning (2 hour)
Concepts of land use planning, and a survey of land use planning as it relates to land and water resource managers.

(Teacher evaluations for 1981: 92, 94, 98 and 99 percentile - ranked against all teaching at UMC.)

Research in Progress:

1. Zuhke, Mona and Alan Everson. "Season Length at Missouri Outdoor Recreation Areas." Approved for publication by Missouri Academy of Science (Refereed journal).
2. Herrick, Theresa and Alan Everson. "Controlling Use of Eleven Point River" Submitted for Publication (refereed journal).
3. Herrick, Theresa and Alan Everson. "Holiday Use of the Eleven Point River" Submitted for publication (refereed journal).
4. Herrick, Theresa, Dena Meyer and Alan Everson. "Recreation on the Mississippi River". Submitted for publication. ("General audience" journal).
5. Belcher, James and Alan Everson. "Toward a New Understanding of Recreation Carrying Capacity". In draft.

Publications:

Schmidt, Tom and Alan Everson. 1980. "1979 Missouri Statewide Comprehensive Outdoor Recreation Plan, Supply Update." University of Missouri, Columbia, (Everson supervised hiring, training, and data collection; directed, reviewed early drafts, rewrote final draft of report.).

- Everson, Alan, 1978. "Standards in State Comprehensive Outdoor Recreation Plans: A Methodological Study". Unpublished Ph.D. Dissertation, Texas A&M University, College Station, Texas.
- Everson, Alan, 1976. "1976 Colorado Comprehensive Outdoor Recreation Plan". Colorado Parks and Outdoor Recreation, Denver. (Agency publication prepared by staff under Everson's direction.)
- Everson, Alan, 1974. "1974 Colorado Comprehensive Outdoor Recreation Plan". Colorado Parks and Outdoor Recreation, Denver. (Agency publication prepared under Everson's direction.)
- Everson, Alan, 1971. "1971 Colorado Comprehensive Outdoor Recreation Plan Digest". Colorado Game, Fish & Parks, Denver. (Agency publication prepared by Everson.)
- Everson, Alan, 1970. "1970 Colorado Comprehensive Outdoor Recreation Plan". Colorado Game, Fish and Parks, Denver. (Agency publication prepared by Everson.)
- Everson, Alan, 1967. "Effect of Membership in Private Swim Club on Recreation Participation". Unpublished Master's Thesis, University of Michigan.

Professional Presentations and Papers:

- Everson, Alan, 1981. "Data Collection", National State Outdoor Recreation Planners Conference.
- Herrick, Theresa and Alan Everson, 1981. "Recreation on the Eleven Point River". National Recreation and Parks Congress, Rivers and Forest Research Symposium.
- Bhullar, Hardeep, Alan Everson and Scott Gunn, 1980. "Social Psychological Implications for Recreation Resource Planning". In: 1980 National Outdoor Recreation Trends Symposium, Durham, New Hampshire, 1980. Conference sponsored by USDA Forest Service, USDA Heritage Conservation Recreation Service, Society of American Foresters and University of New Hampshire. (Refereed paper discussing data on recreation motivations and recreation choices. Gunn and Bhullar provided data: Bhullar, the first draft; Everson, additional analysis and conclusions.)
- Everson, Alan, 1978. "Thoughts of a State Recreation Planner". In: Land Between the Lakes Conference. Sponsored by the Tennessee Valley Authority and Southern Illinois University. (Invited paper discussing insights into campground use, and provision, gained during 8 years in Colorado.)

Grants:

Missouri Department of Natural Resources:

- A. Inventory of outdoor recreation facilities from March 1, 1979 through June 30, 1979: \$30,000.
- B. Inventory of outdoor recreation facilities from July 1, 1979 through December 31, 1980: \$33,125.

Nongrant format, direct funding for:

- A. Graduate level research interviewing users of the Eleven Point National Scenic River, 1980.
- B. Research regarding purchase and use of stoves and firewood in Missouri.

U.S. Army Corps of Engineers (via Oblinger-McCaleb, Inc.)

- A. Contract to measure present demand for outdoor recreation on part of Mississippi River, and
- B. to measure latent demand for outdoor recreation, totaling \$22,000. 1981.

Completed Graduate Students:

Schmidt, Thomas. 1981. "Recreation as a Land Use in Missouri". Unpublished Master's Thesis, University of Missouri.

Mead, Douglas. 1981

Herrick, Theresa. 1981. "Recreational Use of the Eleven Point River", 1980. Unpublished Master's thesis, University of Missouri.

Woods, Fred. 1980. Evaluation of Missouri's "Learn to Camp" program. Unpublished Master's thesis. University of Missouri.

Schneider, Henry. 1979. "Management Information About Birdwatcher's Activities". Unpublished Master's thesis. University of Missouri.

Terry, Ron. 1979. "Camper Interests in Interpretive Services". Unpublished Master's thesis, University of Missouri.

Bartley, Judith. 1978. "Audience Evaluation of Interpretive Presentations". Unpublished Master's thesis. University of Missouri.

Nee, Clint. 1978. "Recreation Plan for the MKT Railroad". Professional paper for Masters.

Fretz, Katherine. 1975. "Social-Psychological Characteristics of Selected Winter Recreationists". Unpublished Master's thesis. University of Colorado.

Bates, Scott. 1974. "Outdoor Recreation Facilities in Colorado". Unpublished Master's thesis. Colorado State University.

Consulting:

Initial work on GREAT III Recreation Study of the Mississippi River, 1980.

Proposal to prepare recreation plans for Lewis and Clark National Recreation Trail.

Some work on actual Old West study of Recreation and Tourism, 1979.

Proposal to prepare a Colorado State Trails Plan, 1979.

Proposal to prepare Tourism Study Design for Old West Regional Commission, 1976.

Proposal to collect Citizen Input in Arizona, 1976.

Proposal to study Recreation Demand for Minnesota, 1976.

Proposal to conduct an Urban Recreation Study for Arkansas, 1975.

Proposal to conduct Visitor Use Surveys of National Parks in Wyoming and Utah, 1975.

References:

1. Dr. Donald P. Duncan, Director, School of Forestry, Fisheries and Wildlife, University of Missouri, Columbia, Missouri 65211
2. Dr. Leslie M. Reid, Chairman, Department of Recreation and Resource Development, Texas A&M University, College Station, Texas 77843
3. Dr. Glenn Gillespie, Associate Dean of Public and Community Service, University of Missouri, Columbia, Missouri 65211

SOUTHERN ILLINOIS UNIVERSITY AT CARBONDALE

CURRICULUM VITAE OF JOHN H. BURDE

Department of Forestry

I. PERSONAL

PII Redacted

C. Assistant Professor, Department of Forestry, Southern Illinois University at Carbondale

II. EDUCATION

B.S.	Michigan State University	Forestry	1968
M.S.	Michigan State University	Forestry	1970
Ph.D.	University of Arizona	Resource Econ.	1975

III. PROFESSIONAL EXPERIENCE

Forestry Aide, USDA Forest Service, Manistee National Forest, Wellson, Michigan. 1967.

Park Ranger, Michigan Department of Natural Resources, Lakeport State Park, Lakeport, Michigan. 1968-1970.

Teaching Assistant, Department of Forestry, Michigan State University. 1968-1970.

Teaching Assistant and Research Assistant, Department of Watershed Management, University of Arizona. 1971-1974.

Assistant Professor, Department of Forestry, Southern Illinois University at Carbondale. 1974 to date.

Outdoor Recreation Planner, USDI Bureau of Land Management, McGrath Resource Area, Anchorage, Alaska. July, 1981-January, 1982.

IV. TEACHING EXPERIENCE

A. Teaching Interests and Specialties:

Recreation Management
Recreation Policy
Recreation Economics
Forest Policy
Forest Land Use Planning

B. Teaching and Training Grants:

Mini-sabbatical - July, 1978
 Horace M. Albright Training Center
 National Park Service
 Grand Canyon National Park, \$550.
 Course: "Orientation to National Park Operations"

Southern Illinois Collegiate Common Market Inter-consortia
 Development Grant, \$250.
 Used to develop lab workbook for park management course.

C. Teaching Awards and Honors: None.

D. Current Graduate Faculty Status: II

E. Number of Master's and Ph.D. Committees on which you have served:

Master's Committees: 23 (Department of Forestry)
 Ph.D. Committees: 2 (Department of Geography)

F. Names of Students who have completed Master's Theses and Doctoral Dissertations under your Direction:

G. L. Reynolds	M.S.	1975-1976
David Mize	M.S.	1976-1977
P. L. Maloney	M.S.	1976-1977
Elizabeth Tapp	M.S.	1978-1979
Karl Kruse	M.S.	1978-1979
Joseph Lenzini	M.S.	1977-1979
Greg Oller	M.S.	1981
Bradley W. McKinney	M.S.	1981
David C. Sniley	M.S.	1981
David C. Berti	M.S.	1981
Greg Chandler	M.S.	1982
Ray Lehn	M.S.	1982

G. Other:

V. UNIVERSITY SERVICE

A. Department Committees:

1975-1976	Undergraduate Curriculum Committee
1976	Department Long Range Planning Committee
1976	CSRS Review Committee
1977-1978	Faculty Welfare Committee
1977-1978	Undergraduate Studies Committee
1975-date	Faculty Advisor, Forestry Club
1979-date	Faculty Policy Committee, Secretary 1979-
1979	Undergraduate Studies Committee, Chairman
1979	Research and Publication Committee

1979- Faculty and Student Welfare Committee, Chairman -
1979
1982 Search Committee - Forest Prospect Position (ad
hoc)

B. College and University Committees and Councils:

1975-1976 Agriculture Social Committee, Chairman (1976)

C. Other:

Faculty Advisor
SIU Forestry Club (1976-date)

VI. PROFESSIONAL SERVICE

A. Membership in Professional Associations:

Society of American Foresters
Forest History Society
National Parks and Conservation Association
National Wildlife Federation
American Forestry Association

B. Offices Held and Honors Awarded in Professional Associations:

Vice-Chairman, SAF Student Chapter, University of Arizona,
1973-1974.
Secretary-Treasurer, Illinois Chapter, Society of American
Foresters. 1981-date.

C. Consultantships:

Chairman, Consortium on Interdisciplinary Resource
Management, Land Between the Lakes, Tennessee Valley Authority.

D. Evaluation of Manuscripts for Journals and Book Publishers
and of Grant Proposals for Agencies.

E. Papers and Presentations at Professional Meetings:

F. Other:

VII. COMMUNITY SERVICE

President, Young Adults Class, University Baptist Church,
Carbondale, Illinois.
Assistant Director, Shawnee Trail Conference.

VIII. RESEARCH

A. Research Interests and Specialties:

Park management and planning
Economics of recreation and forest resources

B. Current Research Projects:

Back Country Shelter Management Policies
Noise Pollution in Urban Recreation

C. Research Grants Applied for:

USDA Forest Service, The feasibility of the proposed Shawnee Hills National Recreation Area. Eastern Region, Milwaukee, Wisconsin. (\$97,763).

USDA Forest Service, The potential of abandoned railroad rights-of-way to meet recreation needs. Urban Recreation, Chicago. (\$15,000).

D. Research Grants Received:

USDA Forest Service, The Availability of Forest and Associated Lands in Illinois. (\$2,000).

American Motorcycle Association. Off-Road Motorcycle Sampling. (\$750).

Department of Conservation, Division of Long Range Planning, Forecasting Recreation Participation Rates for Illinois Recreation Facilities. Springfield, Illinois. (\$97,753).

USDA Cooperative State Research Service, Public Attitudes Toward Timber Harvesting in an Intensively Used Recreation Area. (\$6,000).

USDA Cooperative State Research Service, Assessment of Public Acceptance of Varying Intensities of Timber Harvest in Oak-Hickory Type. (\$9,000).

U. S. Army Corps. of Engineers, Review and Evaluation of Recreation Research and Demonstration Information Program. Vicksburg, Mississippi. (\$7,500).

Tennessee Valley Authority. Land Between the Lakes. Academic Excellence Awards (\$2,000).

Oblinger-McCaleb, Inc. Great III Study. Mississippi River Recreation. (\$15,540).

E. Research Honors and Awards:

Society of American Foresters. National Science Foundation Award to attend World Forestry Congress, Kyoto, Japan. September, 1981. (\$1,450).

F. Other:

IX. PUBLICATIONS

A. Books:

B. Articles in Professional Journals:

McCurdy, D. R. and J. H. Burde. 1975. An objective oriented model for park land use allocation. Proceedings for Workshop on Systems Analysis and Forest Resource Management. Athens, Georgia.

Burde, J. H. et al. 1976. The changing forestry profession: implications for the Department of Forestry, Southern Illinois University at Carbondale, Carbondale, Illinois. 145 pp. Illus.

Chilman, K. C. and J. H. Burde. 1976. Application of research data to carrying capacity determination. Proceedings First Conference on Scientific Research in National Parks. New Orleans, Louisiana

Burde, J. H. and G. L. Reynolds. A dealership survey: an alternative sampling technique in off-road motorcycle use. Southern Illinois University. Ag Review 1977. pp. 71-72.

Burde, J. H. and D. C. Baumgartner. 1978. The availability of forest and associated lands. USDA Forest Service, North Central Forest Experiment Station. NC-236.

Burde, J. H. and D. L. Mize. 1978. The perceptions of the residents of the Harrisburg, Illinois area concerning litter and a mandatory Illinois Deposit Bill. Ag Review 1978. pp. 48-49.

Burde, J. H. and K. Chilman. 1978. Wildland recreation and water quality. In: Final Report, Task Force on Agriculture Non-Point Sources of Pollution. pp. 354-368.

Burde, J. H. and R. L. Drexler. 1978. Consortia: A new look at recreation field studies. In Proceedings: Society of American Foresters National Meeting, St. Louis, Missouri. October 24, 1978. pp. 433-435.

Burde, J. H. 1979. Review of existing campground research: an empirical approach. In Proceedings: Campgrounds and Camping, 1980. Brandon Springs, Tennessee, Tennessee Valley Authority.

Burde, J. H. and J. Lenzini. 1979. Timber harvest and aesthetic quality: can they co-exist? In: Tourism and the Next Decade. George Washington University.

Burde, J. H. and R. E. Drexler. 1978. Consortia: a new look at forest recreation/education field studies. In: Recreation Resource Management and the Professional Forester. Society of American Foresters, Recreation Working Group Tech. Session Proceedings, St. Louis, Missouri. October, 1978.

Burde, J. H. and G. Chandler. 1980. Perceptions of eastern hardwood management: a preliminary look. In: Proceedings of Social Research in the National Parks and other Wildland Areas. U. S. Department of the Interior, National Park Service, Great Smoky Mountains National Park.

Burde, J. H. and D. R. McCurdy. 1980. The Corps of Engineers RRDIP Program. In: Proceedings of Social Research in the National Parks and other Wildland Areas. U. S. Department of the Interior, National Park Service, Great Smoky Mountains National Park.

Burde, J. H. and G. Chandler. 1981. Recreationist Perceptions of timber harvest. In: Proceedings of IUFRO World Forestry Congress, 1981.

Burde, J. H. and G. Chandler. 1981. Public perceptions of harvest intensity in the oak-hickory type. In: Proceedings of the IUFRO World Forestry Congress, 1981.

C. Chapters in Professional Books:

D. Popular and Creative Writing:

E. Book Reviews:

F. Other:

Papers Presented:

"The Availability of Southern Illinois' Forest Resources", Illinois Academy of Science, St. Louis, Missouri. April, 1977.

"The 1976 SCORP Supply Inventory", BOR Workshop on SCORP Planning, McCormick Creek State Park, Indiana. April, 1977.

"Analysis of the Forestry Incentives Program in Illinois", Midwestern Forest Economists Meeting, St. Louis, September, 1977.

"The Forest and Associated Land Resources of Illinois", Midwestern Forest Economists Meeting, St. Louis, September, 1977.

"The Role of Illinois Forests in Providing Outdoor Recreation Opportunity", Illinois Technical Forest Association, Springfield, Illinois. March, 1978.

"Public Attitudes Toward Timber Harvest--A Preliminary View", Midwestern Forest Economists Meeting, Zion, Illinois. September, 1978.

"Consortia: A New Look at Recreation Field Studies", Society of American Foresters National Meeting, St. Louis, Missouri. October, 1978.

"Campground Research-Ag Empirical View", Symposium: Campgrounds and Camping 1980: Trends, Research and Future Needs. Brandon Springs, Tennessee. November, 1978.

"Timber Harvest and Aesthetic Quality: Can they co-exist?", Symposium on Tourism and the Next Decade, Washington, D.C. March, 1979.

"Timber Harvests and Aesthetic Perception". Illinois Chapter/Society of American Foresters, Urbana, Illinois. March, 1979.

"The Corps of Engineers RRDIP Program", Meeting on Social Research in the National Parks and Other Wildland Areas, Gatlinburg, TN., March, 1980.

"Recreationist Perceptions of Timber Harvest", Meeting on Social Research in the National Parks and Other Wildland Areas, Gatlinburg, TN., March, 1980.

"Hardwood Log Exports", Midwest Forest Economist's Meeting, Mackinac Island, WI. September, 1980.

"Substitutability for Backpacking at Rocky Mountain National Park," Meeting on Social Research in the National Parks and Other Wildland Areas, Gatlinburg, TN. March, 1981.

"Electrical Consumption by Campers", Meeting on Social Research in the National Parks and Other Wildland Areas, Gatlinburg, TN. March, 1981.

"The Role of Programming in Camping Demand", Meeting on Social Research in the National Parks and Other Wildland Areas, Gatlinburg, TN. March, 1981.

"Recreationist Perceptions of Timber Harvest", IUFRO World Forest Congress, Kyoto, Japan. September, 1981.

"Public Perceptions of Harvest Intensity in the Oak-Hickory Type", IUFRO World Forestry Congress, Kyoto, Japan. September, 1981.

SOUTHERN ILLINOIS UNIVERSITY AT CARBONDALE

CURRICULUM VITAE OF DWIGHT R. McCURDY

Department of Forestry

I. PERSONAL

PII Redacted

C. Professor, Forestry Department, Southern Illinois University at Carbondale.

II. EDUCATION

B.S.	Purdue University	Forest Management	1960
M.S.	Purdue University	Forestry (Operations Research)	1961
Ph.D.	Ohio State University	Natural Resource Economics	1964

III. PROFESSIONAL EXPERIENCE

Forester

U. S. Forest Service, 1961.

Research Forester

U. S. Forest Service, 1962-1965.

Professor

Department of Forestry, Southern Illinois University at Carbondale, Carbondale, Illinois 1965-to date.

Assistant to the Chief

Wildlife Refuges, U. S. Fish and Wildlife Service (Sabbatical), 1971.

IV. TEACHING EXPERIENCE

A. Teaching Interests and Specialties:

Forest Economics
Park Management
Resource Decision-making

B. Teaching and Training Grants: None.

C. Teaching Awards and Honors: None.

D. Current Graduate Faculty Status: III

E. Number of Master's and Ph.D. Committees on which have served:

More than 100 M.S. and Ph.D. Committees

F. Names of Students who have completed Master's Theses and Doctoral Dissertations under your Direction:

Stanley K. Brickler	1965	Glenn R. Marlow	1970
Herbert E. Echelberger	1966	E. R. Miller	1970
Charles W. Krukewitt	1966	Louis R. Waller	1970, 1973
John Rinehart	1966	Dean B. Brandenburg	1971
Walter H. Baumgardner	1967	Bernard F. Brown	1971
Larry K. Johnson	1967	Robert S. Wilkins	1971
Donald E. VanOrmer	1967	Neil S. Hartman	1972
Michael J. LaForest	1967	James M. Keiton	1972
Beverly G. Miller	1967	Michael McLendon	1973
Robert Cunningham	1968	John Davis	1974
Charles P. Doty	1968	Robert P. Bizal	1975
David V. Fligor	1968	Gordon Cheniaie	1975
John D. Schindler	1968	Thomas F. Ladney	1975
Phillip K. Jenkins	1969	James P. Berneir	1976
Dick C. Littler	1969	David R. Schmidt	1976
William G. McKibben	1969	Ronald E. Daun	1977
William G. Spangenberg	1969	Joseph P. Pollini	1978
Conrad R. Wentzel	1969	Patricia Tucker	1978
Louis Freitag	1970	John R. Vitello	1979
Harold E. Johnson	1970	Debora Stokes	1980

G. Other:

V. UNIVERSITY SERVICE

A. Department Committees:

Assistant Chairman
Faculty Policy Committee

B. College and University Committees and Councils:

Graduate School Membership
Faculty Senate
Faculty Senate, Budget, Chairman
Faculty Senate, Executive
President's Task Force Academic Priorities

C. Other:

VI. PROFESSIONAL SERVICE

A. Membership in Professional Associations:

Society of American Foresters
Illinois Technical Forestry Association
National Conference on State Parks
National Parks and Recreation Association
Illinois Parks and Recreation Society
Society of American Park Educators
American Institute of Park Executives

American Camping Association
 International Union of Forest Research Organizations
 People/Natural Resources Research Council

B. Offices Held and Honors Awarded in Professional Associations:

National Athletic Honor Society
 XI Sigma PI (Forestry Honorary)
 Soil Conservation Society Outstanding Paper

C. Consultantships:

Periodically with Federal and State land management agencies (Forest Service, Bureau of Land Management, Fish & Wildlife Service, Corps of Engineers, Tennessee Valley Authority, Illinois Department of Conservation).

D. Evaluation of Manuscripts for Journals and Book Publishers and of Grant Proposals for Agencies: None.

E. Papers and Presentations at Professional Meetings:

McCurdy, D. R. 1964. Making Woodland Recreation Pay. Proceedings Society of American Foresters Meeting. Denver, Colorado. pp. 156-158. Illus.

McCurdy, D. R. 1967. Recreation and Tourism Tomorrow. Proceedings of the Tenth Annual Workshop for Farmers' Cooperatives. Carbondale, Illinois. pp. 12-16.

Myers, C. C., and D. R. McCurdy. 1974. Monitoring of Forest Land Environment. Midwest Forest Mensurationists and SAF Biometrics Working Group Proceedings.

McCurdy, D. R. 1975. A Park Land Use Allocation Model. Workshop for Outdoor Recreation Researchers and Cooperators Proceedings, Brandon, Springs, Tennessee. March 9-12.

McCurdy, D. R. 1975. A System of Measuring Public Use on Wildlands. Interagency Outdoor Recreation Visitor Use Measurement Symposium Proceedings, Anchorage, Alaska. pp. 56-75.

McCurdy, D. R. 1975. The Benefits of a Public Use Measurement System. Interagency Outdoor Recreation Visitor Use Measurement Symposium Proceedings, Anchorage, Alaska. pp. 21-37.

McCurdy, D. R., and J. H. Burde. 1975. An Objective Oriented Model for Park Land Use Allocation. Proceedings for Workshop on Systems Analysis and Forest Resource Management. Athens, Georgia.

McCurdy, D. R., and C. C. Myers. 1975. The Status of Computer Mapping in Forestry. Proceedings of Midwest Mensurationists Meeting, Lake Barclay, Kentucky. October 30-31.

Myers, C. C., and D. R. McCurdy. 1976. Computer Mapping in the Urban Forest. Proceedings IUFRO Symposium, Vancouver, British Columbia, Canada. June. pp. 15-27. Illus.

Waller, Louis R., and D. R. McCurdy. 1977. A Model for Establishing Water Quality Standards for Rivers. Proceedings on River Recreation Management and Research Symposium, Minneapolis, Minnesota. January, 1977. pp. 380-388. Illus.

McCurdy, D. R., and C. C. Myers. 1978. Methodologies for Designing Resource Inventories to Support Management Information Systems, U. S. Forest Service General Technical Report RM-55.

Burde, John N., and D. R. McCurdy. 1980. The Corps of Engineers Recreation Research Demonstration Program. Social Research Conference, Gatlinburg, Tennessee.

McCurdy, D. W. 1980. Economics of Recreation as Applied to Forest Management. Central States SAF Annual Meeting, College Corner, Ohio.

McCurdy, D. R. 1980. Exportation of Hardwood Logs. Midwest Forest Economists Annual Meeting, Mackinac Island, Michigan.

McCurdy, D. R. 1981. A Critical Look at the Expected Return on Investment from Planting Black Walnut Seedlings. Walnut Council Meeting, West Lafayette, Indiana.

McCurdy, D. R. 1981. Wooden Pallets: 1980 Impacts on Forest Resource Competitors. Midwest Forest Economist Annual Meeting, Cedar, Michigan.

F. Other

VII. COMMUNITY SERVICE

VIII. RESEARCH

A. Research Interests and Specialties:

Forest Production Economics
 Natural Resource Economics
 Park Management
 Resource Decision-making

B. Current Research Projects

Great III Recreation Study (\$15,000)

Wood Use in Pallets. Forest Products Lab. (\$34,000).

Analysis of the Pallet Industry. McIntire-Stennis.
 (\$20,000).

Firewood Consumption in Illinois (\$35,000)

C. Research Grants Applied for:

A Comparison of Market Prices with Bidding
 Variations USFS. (\$24,185).

D. Research Grants [REDACTED]:

1966	USDA	\$ 4,000
	USDA	7,000
	Ill. Dept. Bus. & Econ. Dev.	1,200
1967	SIU Res. & Proj.	4,000
	USDA	12,000
	USDA	3,500
	USDA	11,500
1969	USDA	4,500
	USDA	4,500
1971	SIU Res. & Proj.	2,700
1972	USDA	23,000
1973	USDA	5,900
1975	SIU Res. & Proj.	2,380
1976	USDA	8,000
1977	Ill. Dept. Cons.	98,000
	USDA	6,000
1978	USDA	11,000
	CETA	175,000
	SIU Res. & Proj.	12,000
1979	USDD (Corps. of Eng.)	7,500
	USDA	13,000
1980	USFS	15,000
	USDA	8,000
1981	USDA	10,000
	USFS	35,000
	USFS	18,000
	USDD (Corps. of Eng.)	15,000

E. Research Honors and Awards: None

F. Other:

IX. PUBLICATIONS

A. Books:

McCurdy, D. R., W. G. Spangenberg, and C. P. Doty.
1972. How to Choose Your Tree: A Guide to Parklike
Landscaping in Illinois, Indiana, and Ohio. Southern
Illinois University Press. 160 pp. Illus.

McCurdy, D. R. 1971. A System for Measuring Public Use
on the National Wildlife Refuges. U. S. Dept. of the
Interior Handbook. Washington, D. C.

McCurdy, D. R. 1982. Park Management. Southern
Illinois University Press. 500 pp. Illus. (In press).

B. Articles in professional Journals:

McCurdy, D. R. 1963. Ohio's Private Outdoor and Forest
Recreation Enterprises. U. S. Forest Service, Central
States Forest Experiment Station. 49 pp. Illus.

McCurdy, D. R. 1963. Ohio's Private Outdoor and Forest
Recreation Industry. Ohio Conservation Bulletin 27(12).
pp. 16-18. Illus.

McCurdy, D. R. 1964. Income from Recreation. Ohio
Woodlands 2(1):4-5. Illus.

McCurdy, D. R. 1965. The Forest Recreation
Provider--Who is He? Journal Soil and Water
Conservation 20(3):99-100. Illus.

McCurdy, D. R., and R. M. Mischon. 1965. A Survey of
Ohio's Forest and Picnic Business. U. S. Forest Service,
Central States Forest Experiment Station. Paper 37.
6 pp. Illus.

McCurdy, D. R., and R. M. Mischon. 1965. Outdoor
Recreation and Ohio Bankers. The Ohio Banker
57(11):3-9, 28. Illus.

McCurdy, D. R., and R. M. Mischon. 1965. A Look at
the Private Campground User. U. S. Forest Service
Research Paper CS-18. 12 pp. Illus.

McCurdy, D. R. 1966. A Second Look at Camping Demand
Predictions. Journal of Forestry 64(9):631.

McCurdy, D. R. 1966. The Giant City State Park Camper.
Illinois Park and Recreation Quarterly 1(4):10-12.
Illus.

McCurdy, D. R., and W. F. Cowen. 1966. Canoe Trip Enterprises Needed. Ohio Woodlands 4(1):4-6. Illus.

McCurdy, D. R. 1967. More than Half of Giant City Park Campers are Weekend Visitors. Agriculture at Southern, January-February, Southern Illinois University at Carbondale, Carbondale. 3 pp.

McCurdy, D. R. and Larry K. Johnson. 1967. Recommend Policies for the Development and Management of State Park Systems. Southern Illinois University at Carbondale, School of Agriculture Publication No. 26, Carbondale. 34 pp.

McCurdy, D. R., and H. E. Echelberger. 1967. The Outdoor Recreation Lease in Illinois. Southern Illinois University at Carbondale, School of Agriculture Publication No. 25. pp. 31.

McCurdy, D. R. 1968. Horseback Riding Enterprises Do Best Near Recreation or High Population Areas. Agriculture at Southern, March-April. Southern Illinois University at Carbondale. 2 pp.

McCurdy, D. R. and R. A. Cunningham. 1968. The Park Visitor and His Preferences for Picnic Tables and Fire Grills. Illinois Park and Recreation Quarterly 3(3):14-16. Illus.

McCurdy, D. R. and R. Cunningham. 1968. Survey Shows User Preference for Picnic Tables and Fireplace Grills. Agriculture at Southern, July-August, Southern Illinois University at Carbondale. 2 pp.

McCurdy, D. R., and H. E. Echelberger. 1968. The Hunting Lease in Illinois. Journal of Forestry 66(2):124-127. Illus.

McCurdy, D. R., and D. V. Fligor. 1968. Horseback Riding Enterprises on the Farm. Southern Illinois University at Carbondale, School of Agriculture Publication No. 31. 24 pp. Illus.

McCurdy, D. R., and B. G. Miller. 1968. The recreationist at the Crab Orchard National Wildlife Refuge and His Opinions of Users Fees. Southern Illinois University at Carbondale, Department of Forestry Publication No. 1. 26 pp. Illus.

McCurdy, D. R., and B. G. Miller. 1968. User Opinions of the Land and Water Conservation Fund Fees. Illinois Park and Recreation Quarterly 3(2):16-17, 25. Illus.

McCurdy, D. R., and William G. McKibben. 1969. Land for Public Hunting and Fishing. Illinois Wildlife 5(1):3-4. Illus. Also published in the Civil Service Employees News, Chicago, Illinois.

McCurdy, D. R., and W. G. McKibben. 1969. Twenty Percent of Privately Owned Land is Open to Hunting and Fishing in Seven Southern Illinois Counties. Agriculture at Southern, September - October, Southern Illinois University.

McCurdy, D. R., and P. K. Jenkins. 1969. Duck Hunters at the Oakwood Bottoms Greentree Reservoir, Shawnee National Forest, Illinois. Southern Illinois University, Department of Forestry Publication No. 4. 20 pp. Illus.

McCurdy, D. R., and D. Little. 1970. Illinois Municipal Water Supply Reservoirs--Do They Provide Their Share of Recreational Opportunities? Illinois Park and Recreation Quarterly 5(2):8-9. Illus.

McCurdy, D. R. 1970. A Manual for Measuring Public Use on Wildlands--Parks, Forests, and Wildlife Refuges. Southern Illinois University at Carbondale, Department of Forestry Publication No. 5. 47 pp. Illus.

McCurdy, D. R., and C. R. Marlow. 1971. A Look at Visitors to the Parks and Recreation Areas to be Connected by the Proposed George Rogers Clark Scenic Drive in Southern Illinois. Southern Illinois University at Carbondale, Department of Forestry Publication No. 6. 28 pp. Illus.

McCurdy, D. R., and Harold E. Johnson. 1972. Vandalism at State Parks in Illinois. Illinois Parks and Recreation Quarterly 7(4): 8 pp. Illus.

McCurdy, D. R., and L. R. Waller. 1972. A Manual for Preparing State Park System Operations Handbooks. Department of Forestry Publication No. 9. Southern Illinois University at Carbondale. 23 pp. Illus.

McCurdy, D. R., and J. M. Keeton. 1973. The Illinois State Forest Visitor. Southern Illinois University at Carbondale. Department of Forestry Publication No. 11. 23 pp. Illus.

McCurdy, D. R., and R. S. Wilkins. 1973. A Computer Approach to Determining Outdoor Recreation Capability of a Large Tract of Land. Southern Illinois University. Department of Forestry Publication No. 13. 41 pp. Illus.

- McCurdy, D. R. 1974. The Public Use Survey, A Useful Administrative Tool. Illinois Parks and Recreation Quarterly 5(4):24-25.
- McCurdy, D. R., and N. S. Hartman. 1974. A Resource Inventory Method to Support Lane Use Planning. Southern Illinois University at Carbondale. Department of Forestry Publication No. 14. 43 pp. Illus.
- McCurdy, D. R. 1975. A Comparison of Wildland User-Types. Ag. Review, 1975. Southern Illinois University at Carbondale. 40-41.
- McCurdy, D. R., and R. P. Bizal. 1976. The Gasoline Shortage and Its Effect on Outdoor Recreation Use of Public Lands. Ag. Review, 1976. Southern Illinois University at Carbondale. 68-70.
- McCurdy, D. R., and J. Bernier. 1976. Recreational Use Patterns of the Wheelchair Disabled. Illinois Parks and Recreation 7(5):4-5. Illus.
- McCurdy, D. R., and B. F. Brown. 1976. A Non-Computerized Model for Timber Product Mix Decision-Making. The Consultant: 21(2):48-52. Illus.
- McCurdy, D. R., and T. F. Ladny. 1976. A Catalog of Natural and Man-made Features, National Wilderness Area. Southern Illinois University at Carbondale. 83 pp. Illus.
- McCurdy, D. R., et al. 1976. The Changing Forestry Profession: Implications for the Department of Forestry, Southern Illinois University at Carbondale. 145 pp. Illus.
- McCurdy, D. R. 1977. An Overview of the National Wilderness Preservation System. Journal of Forestry 85(3):260-262. Illus.
- McCurdy, D. R. 1977. Illinois Timber Prices, 1967-76. Department of Forestry, Southern Illinois University at Carbondale.
- McCurdy, D. R. 1977. Systems, Decision Theory, and Natural Resource Management. Southern Illinois University at Carbondale Bookstore. November. 48 pp.
- McCurdy, D. R., and F. F. Fellers. 1977. A Profile of the Illinois Timber Buyer. Department of Forestry Publication, Southern Illinois University at Carbondale. p. 12. Illus.

McCurdy, D. R., and T F. Ladny. 1977. A Summary of Man-Made Features of National Wilderness Areas. Ag. Review 1977. Southern Illinois University at Carbondale. pp. 78-80. Illus.

McCurdy, D. R., and P. D. Maloney. 1977. A Look at Federal Forest Incentive Programs in Illinois. The Northern Logger and Timber Processor 26(1):20, 31. Illus.

McCurdy, D. R., and P. D. Maloney. 1977. A Look at Federal Forest Incentive Programs in Illinois. The Northern Logger and Timber Processor 26(1):20, 31. Illus.

McCurdy, D. R. 1978. A Study of Owners of Large, Private Forested Tracts in the Shawnee Hills Region, Illinois. Department of Forestry Publication. 29 pp. Illus.

McCurdy, D. R. 1978. The Illinois Timber Buyer. Illinois Business Review 35(10):6-7.

McCurdy, D. R., and D. Schmidt. 1978. An Analysis of Law Violations at Federal Recreation Areas. Ag. Review, Southern Illinois University at Carbondale. pp. 56-69.

Burde, J. H., and D. R. McCurdy. 1979. Review and Evaluation of Recreation Research and Demonstration Information Program. Corps of Engineers, U. S. Department of Defense. pp. 97. Illus.

Leiber, S., D. McCurdy, et al. 1979. Forecasting Outdoor Recreation Participation in Illinois, 1976-1995. Southern Illinois University at Carbondale Report, Four Volumes.

McCurdy, D. R. 1979. A Description of the Primary Wood-Using Industries in Southern Illinois. Illinois Business Review 36(9):4-5.

McCurdy, D. R., and J. Vitello. 1979. Large, Private Forested Tract Owners. Ag Review. pp. 65-68.

McCurdy, D. R., and J. Vitello. 1979. Private Forested Tract Owners. Southern Lumberman 239(2962): 9-10.

McCurdy, D. R., and F. F. Fellers. 1979. The Purchase of Timber in Illinois. Ag. Review. 61-63.

McCurdy, D. R., and P. Tucker. 1979. Trends in Beach Use Patterns at the Crab Orchard National Wildlife Refuge, 1968-1978. Ag. Review. 64-65.

McCurdy, D. R., and J. Vitello. 1980. Owners of Large, Private Forested Tracts in the Shawnee Hills Region, Illinois. *Journal of Forestry* 78(4):211-212

Burde, J. H., and D. R. McCurdy. 1981. Data Needs and Analysis of the Corps of Engineers Recreation Research Demonstration Program. U. S. National Park Service, Atlanta, Georgia. 129-133.

McCurdy, D. R. 1981. Hardwood Log Exports. *Northern Logger & Timber Processor* 29(0):52.

McCurdy, D. R. 1981. The Hardwood Log Export Situation in the United States. *Southern Lumberman* 241(3004):7-8. Illus.

McCurdy, D. R. 1981. The Primary Wood-Using Industries in Southern Illinois. 1980. *Ag. Review*. pp. 54-56.

McCurdy, D. R., and L. B. Reeder. 1981. Visitation at an Eastern Wilderness Area. 1980 *Ag. Review*. 51-54

McCurdy, D. R., and D. W. Wildermuth. 1981. The Pallet Industry in the United States, 1980. *Southern Lumberman*. 241(3010):10-11. Illus.

McCurdy, D. R. 1982. A Critical Look at the Expected Return on Investment from Planting Black Walnut Seedlings. U. S. Forest Service General Technical Report. (In Press).

C. Chapters in Professional Books:

McCurdy, D. R. 1980. National Parks. *Arête Encyclopedia*.

McCurdy, D. R. 1980. Inter-National Parks. *Arête Encyclopedia*.

D. Popular and Creative Writing: None

E. Book Review:

Forest Ownership for Pleasure and Profit, by Hardy L. Shirley and Paul F. Graves. *Journal of Leisure Research* 3(2). 1971.

F. Other:

Thesis and Disseration:

McCurdy, D. R. 1961. A Linear Programming Simulation of an Indiana Woodland. Master's Thesis. Purdue University. 89 pp.

McCurdy, D. R. 1964. Factors Associated with Willingness of Private Woodland Owners in Ohio to Provide Outdoor Facilities. Ph.D. Dissertation. Ohio State University. 216 pp. Illus.

Synopsis of Resume of
Donald R. Kurz

Natural History Section
Missouri Conservation Department
P. O. Box 180
Jefferson City, MO 65102
314/751-4115 Ext. 200

Employment

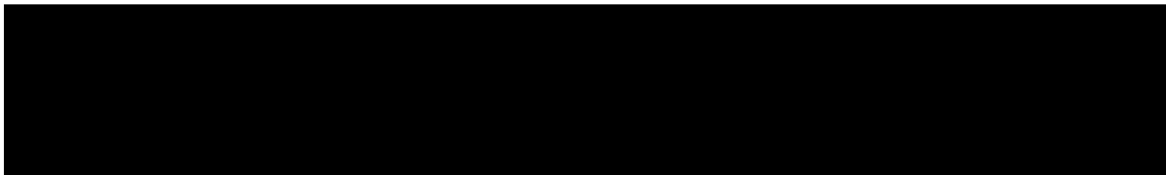
November, 1980 - Present	Natural History Land Specialist Natural History Section, Conservation Dept. Jefferson City, MO
February 1980 - October 1980	Natural Areas Inventory Coordinator Natural History Section, Conservation Dept. Jefferson City, MO
May 1978 - January 1980	Research Director, Natural Land Institute Rockford, IL
June 1976 - December 1979	Natural Areas Ecologist, Illinois Natural Areas Inventory, Urbana, IL
August 1974 - May 1976	Teaching and Research Assistant, Botany Dept., Southern Illinois University, Carbondale, IL
July 1972 - July 1974	Chemist III, Unit Manager, Division of Laboratories, Illinois Environmental Protection Agency, Carbondale, IL

Education

1963-1965	Springfield Junior College, Springfield, IL Degree: A.A. Major: Liberal Arts and Sciences
1965-1967	Southern Illinois University, Carbondale, IL Degree: B.A. Major: Zoology Minor: Botany
1967-1969	Southern Illinois University, Carbondale, IL Degree: M.S. Major: Zoology Minor: Microbiology
1974-1976	Southern Illinois University, Carbondale, IL Degree: M.A. Major: Botany

Personal

PII Redacted



PUBLICATIONS AND REPORTS

- Kurz, D.R. 1968. A study of Trichodina in aquatic snails from southern Illinois. Unpublished thesis. Southern Illinois University, Carbondale. 20 p.
- _____. 1978. Field survey for endangered plants. p. 296-297.
In White, John. 1978. Illinois Natural Areas Inventory technical report, Volume I: Survey methods and results. Illinois Natural Areas Inventory, Urbana. 426 p.
- _____. 1978. Limestone glades of Illinois. In Proceedings of Sixth North American Prairie Conference. Ohio State University, Columbus. 1982.
- _____, G.A. Paulson, and D.W. Morgan. 1978. Inventory of natural areas in the Indiana coastal zone. Unpublished report. Natural Land Institute, Rockford. 70 p.
- _____. 1979. Cacti of Big Bend National Park, Texas. Unpublished thesis. Southern Illinois University, Carbondale. 182 p.
- _____. 1979. Indiana cypress study. Unpublished report. Natural Land Institute, Rockford. 17 p.
- _____. 1979. Inventory of natural areas in LaPorte County, Indiana. Unpublished report. Natural Land Institute, Rockford. 61 p.
- _____. 1979. Inventory of natural areas in southern Lake County, Indiana. Unpublished report. Natural Land Institute, Rockford. 54 p.
- _____. 1979. Vegetation of the Momence Wetlands. p. 45-46. In The Momence Wetlands of the Kankakee River in Illinois--An assessment of their value. Institute of Natural Resources, Chicago. 55 p.
- _____. 1979. Proposed Federally endangered and threatened plant species in Illinois. Unpublished report. Natural Land Institute, Rockford.
- _____. 1980. Great Plain's ladies'-tresses, Spiranthes magnicamporum Sheviak. Journal of the Missouri Native Plant Society, St. Louis. 2(2):9-10.
- _____. 1980. Missouri Natural Areas Inventory. Missouri Conservationist. Jefferson City. December 1980.
- _____. 1981. Missouri Natural Areas Inventory: Franklin, Jefferson, St. Louis & Washington Counties. Missouri Conservation Department. 59 p.

WARREN J. OBLINGER

**PLANNING DEVELOPMENT SERVICES, INC.
(Formerly Oblinger-Smith Corporation)**

URBAN DESIGNER/LANDSCAPE ARCHITECT

Purdue University, 1946-1947

**Bachelor of Science, Landscape Architecture
Iowa State University, 1950**

**Brookings Institute Certificate
Regional Policy Conference**

1970 - Present	President Planning Development Services, Inc. (Formerly Oblinger-Smith Corporation)
1969 - 1979	Associate Professor/Member of Graduate Faculty, Landscape Architecture/Planning College of Architecture & Design Kansas State University Manhattan, Kansas
1954 - 1970	Landscape Architect & Planning Consultant Private Practice Oblinger+Smith, Landscape Architects & Planners Wichita, Kansas
1953 - 1954	Resident Landscape Architect National Park Service Santa Fe, New Mexico
1951 - 1953	Assistant Planner Wichita-Sedgwick County Planning Dept: Wichita, Kansas
1950 - 1951	Landscape Architect & Site Planner A & E Consulting Firm Omaha, Nebraska

MAJOR WORK EXPERIENCE:

**As an employee of consulting firm and public agencies, 1950 to 1954 --
Worked as a team member on master plans for military installations, major
housing projects, educational/religious institutions, national parks/monuments,
transportation facilities and served in the current plans division of a metro-
politan planning agency. Construction plans and documents as well as con-
struction inspection were provided for the landscape and site elements of the**

above projects or selected phases thereof. Responsible for reviewing proposed development plans submitted to public planning agency to ascertain their conformance to local ordinances and development standards. Assisted developers in establishing preliminary subdivision designs and arrangement of land uses.

As a principle and majority owner in a private consulting firm, 1954 to present -- Serves as Chief Executive Officer of a multidisciplined consulting firm in planning, design and development. In this capacity is responsible for business affairs as well as client relations, job acquisition and supervision of professional staff to assure a quality service.

Services provided include land planning for over 35,000 acres, including a new town of approximately 4,000 acres. Comprehensive plans for over 50 communities and counties; 20 multi county regions and 10 states in the Midwest, Southwest, Great Plains and Rocky Mountain regions, redevelopment plans for numerous central cities and neighborhoods were developed and many implemented. Landscape plans provided for multi-family, residential, major commercial and large industrial developments. Provided planning services and feasibility studies for airports, transit facilities, industrial parks as well as comprehensive park/recreation master plans with implementation documents. Master plans for numerous institutions, colleges, universities, hospitals, state capitols, etc, have been conducted under his supervision. Tourism and recreation feasibility studies have been a major service provided by the PDS, Inc. firm since its inception. The firm has architectural and engineering capabilities and has provided plans and construction supervision on numerous structures.

In addition is responsible for Corporation's joint ventures and participation in landscape, parks/recreation planning and landscape irrigation plans for military bases in Saudi Arabia and other Middle East countries.

As a result of his insistence on quality professional design services, the firm has been recognized with ten design awards in landscape architecture, architecture and graphic design. These awards have been bestowed by the American Society of Landscape Architects (ASLA), American Association of Nurserymen, Associated Landscape Contractors of America and American Concrete Institute.

PROFESSIONAL AFFILIATIONS

- American Society of Landscape Architects
- American Institute of Certified Planners

OTHER ASSOCIATIONS

- Urban Land Institute
- American Planning Association
- American Society of Consulting Planners

Registered Landscape Architect in Kansas and Nebraska. Resgistration withdrawn in good standing from three other States.

JAMES M. HEINICKE
PLANNER/ECONOMIST

PLANNING DEVELOPMENT SERVICES, INC.

Bachelor of Mathematics
Wichita State University, 1971

Master of Economics
Wichita State University, 1972

1981 - Present	Planner/Economist Planning Development Services Inc.
1976 - 1981	Executive Director Health Systems Agency of Southeast Kansas
1979 - Present	Adjunct Professor in Health Planning and Administration; Wichita State University
1973 - 1976	Planner; Wichita-Sedgwick County Metropolitan Area Planning Department
1974	Statistics Instructor Kansas Newman College

MAJOR WORK EXPERIENCE

- Performed feasibility analyses for major housing and commercial development projects for private clients.
- Prepared GREAT III Mississippi River Recreation and Natural Areas Needs Assessment. Included inventory and evaluation of existing recreation sites and facilities, projection of future use, and land requirements on 300 mile reach of the Mississippi.
- Prepared health data profiles highlighting all aspects of health care system in Northeast Kansas. Also prepared studies of Physician Recruitment and Nurse Recruitment/Retention for rural areas.
- Assisted in preparation of Jones Trust Youth Recreation Maintenance Manual regarding operation and maintenance of parks and recreation facilities.
- Designed feasibility analysis for new fairgrounds and multipurpose facilities in Sheridan, Wyoming.

Health Systems Agency

- Executive Director of agency that reviewed need, financial feasibility, capital resource availability, and technical aspects of health care delivery. Prepared numerous long-range plans for various types of health services.

Wichita Sedgwick County Metropolitan Area Planning Department

- Fiscal Impact Studies. Developed pragmatic, usable mathematical model to measure the fiscal impacts of new or proposed residential development on the revenue/expenditure structure of local government units. Examined revenues and costs of all city departments, county government and the school district. Model is capable of, but does not require, computer simulation.
- Input/Output Study. Prepared specific methodology to use for the Wichita-Sedgwick County Input/Output Matrix. Purpose was to examine income and employment multipliers, interdependencies in the local industrial structure, and potential constraints of the regional economic system.
- Annual Intergovernmental Enumeration and Socio-Economic Survey. The enumeration was an annual "mini-census" of the entire population of Sedgwick County. Determined the content of the surveys, the interview form and questions, and the format of information summaries generated from the survey. Drafted confidentiality resolution concerning data in this system.
- Land Use Survey. Directed update of automated Land Use Information System utilizing computer-assisted windshield survey.
- Employment Survey and Information System. Directed development of information system and a survey of employers that was conducted to obtain the base year data inputs for the system.
- Forecasting Socio-Economic Variables. Developed population projections for Butler and Harvey Counties using a variety of projection techniques. Devised forecast methods for labor force, vehicle ownership, and family income.
- Miscellaneous: Investigated feasibility of carpooling schemes, their costs, likelihood of success, and system implementation. Conducted feasibility study of Projective Land Use Model and others to forecast small area population, employment, and land use, and for policy simulation. Used "DIME" file, a special geographic base file, to ADMATCH information sets and determine usefulness for networking, location studies, and other applications. Examined possibilities of using information files to perform computerized voter registration.

PROFESSIONAL ASSOCIATIONS

American Planning Association
American Health Planning Association
American Public Health Association
Kansas Region III Emergency Medical Services Council
Interagency Research Commission of Sedgwick County
Wichita-Sedgwick County Population Forecast Advisory Committee
Health Agencies Executive Council
Mental Health Association in Sedgwick County

KENNETH L. KALLENBACH

PLANNING DEVELOPMENT SERVICES, INC.

BACHELOR OF ARCHITECTURE
KANSAS STATE UNIVERSITY, 1966

MASTER OF URBAN PLANNING (URBAN DESIGN-OPTION)
UNIVERSITY OF WASHINGTON, 1968

1972 - 1981	Urban Designer, Planning Development Services, Inc., Wichita, Kansas
1968 - 1972	Principal Planner, Wichita-Sedgwick County Metropolitan Area Planning Department, Wichita, Kansas-
1967 (Summer	Planner, Harstad and Associates, Engineers, Architects and Planners, Seattle, Washington
1967 - 1968	Research Assistant, University of Washington, Seattle, Washington
1966 (Summer)	Construction planning and scheduling, Eby Construction, Wichita, Kansas
1965 (Summer)	Architect, Kruse, Roberts & Smith, Wichita, Kansas
1965 - 1966	Teaching Assistant in Building Equipment, Kansas State University, Manhattan, Kansas

Major Work Experience

- Feasibility Studies - Project Manager for feasibility studies involving locational, financial, environmental impact space adaption/reuse rate schedules and other aspects of the following subjects:
 - Historical structures;
 - Institutional and public facilities;
 - Industrial parks, housing, commercial development;
 - Parking; and
 - Downtown development and redevelopment.
- Leisure Resources and Facility Planning and Design - Project Manager for public client work in the following areas:
 - Lake and reservoir recreation Master Plans for Corps of Engineers
 - Local, regional and statewide (State Outdoor Recreation Plan) parks, recreation and open space programs, planning and design
 - Multi-state Study design (Old West Commission) for tourism and non-resident recreation assessment.
 - Passive and active linear open space planning (rivers, canals, R.O.W.'s, etc.)
 - Resource planning for National Historic Sites and Wildlife Refuges.

- Institutional Planning - Planner-in-Charge for program development, space analysis, establishment of physical and fiscal design criteria, plan policy development (and use, utilities, circulation, densities, etc.) and implementation procedures for several institutions as follows:
 - Regent campuses
 - Health care (hospitals, Red Cross)
 - Quasi public agencies (YMCA)
 - Capitol Area Plaza Master Plan
- Neighborhood and Downtown Conservation. A project manager for numerous governmental and privately sponsored revitalization projects and plans in small towns and metropolitan areas. These have dealt with the specifics of financial implementations, scheduling, traffic and transit, parking, cultural facilities, historical preservation, image creation, public service assessment, taxation policies and other conservation/redevelopment issues.

With Wichita-Sedgwick County Metropolitan Area Planning Department

- Planner-in-charge for developing School Facilities Plan for Wichita School System. This involved goal delineation; facility evaluation; enrollment projections; as well as recommendations on facility needs and locational analysis. The feasibility portion of this Plan included cost estimation and financing methods.
- Team member of North Wichita Thruway Location Study.
- Prepared two urban design studies - Toward a More Livable City and the Canal Route Open Space Corridor. The first has been referenced in the ASPO Bibliography on Environmental Design, and the latter was presented as a paper to the subcommittee of Highway Research Board in January, 1971.
- Responsible for development of Wichita-Sedgwick County Metropolitan Area Initial Housing Element.
- Assisted in Center City Planning for Wichita.
- Staff resource and coordinator to Coalition Planning Housing Task Force, City of Wichita, Kansas.

With University of Washington

- Assisted in development of the HUD sponsored Urban Design within the Comprehensive Planning Process Study.

At Kansas State University

- Architectural thesis consisted of site planning and architecture proposal for the new Wichita Zoo. Site planning dealt with circulation, parking, utilities, landscaping, animal display and building placements for the 160 acre site.

PROFESSIONAL AFFILIATIONS

- American Planning Association
- NAHRO

APPENDIX J

SCOPE OF WORK

SCOPE OF WORK
RECREATION AND NATURAL AREA NEEDS ASSESSMENT
FOR THE GREAT III STUDY AREA

Great River Resource Management Study

1. Description of Work.

a. This study shall address the following problems which have been identified by the Recreation Work Group (RWG):

(1) There is a lack of recreation opportunities in the GREAT III study area.

(2) Undisturbed areas in GREAT III study area with the potential to be designated as natural areas have not been protected.

b. Although considerable data now exists concerning each of the above problem statements, no comprehensive effort has been previously made to study these problems for the GREAT III study area.

c. The primary goals of this study are as follows:

(1) Determine current and projected recreation use of the river and associated land areas.

(2) Assess the need for additional recreation development.

(3) Identify natural areas in order to preserve their unique biological or geological importance.

d. Upon completion of the study, the Contractor shall prepare a final report.

2. Project Location. The study area shall include the main stem of the Mississippi River and its flood plain and bluffs from Saverton, Missouri (Lock and Dam 22) to Cairo, Illinois (Ohio River). Because of their importance as scenic overlooks, this study shall also include bluff top areas which extend 300 feet beyond the bluff's crest.

3. Work to be Performed by the Contractor.

a. Task One. The Contractor shall undertake a familiarization trip, prepare an Overall Recreation and Natural Area Needs Assessment Study Design and Work Schedule and conduct a meeting to discuss these tasks with the Recreation Work Group.

b. Task Two. The Contractor shall develop a two part inventory of the Great III region including an inventory of recreation areas and an inventory of natural areas.

(1) The first inventory shall include all public and private recreation areas in the study region. In order to accomplish this task, the Contractor shall conduct an in-depth review of related literature, Government reports and recreation plans which include inventory data. Secondary source data will be utilized in order to bring all inventory data to the necessary level of detail and field checking will not be provided. The Contractor shall provide three major types of information in the final product; location (on a 7.5 topographic map), ownership (local, state, federal or private), and a listing of the major recreation facilities found on the site in question.

(2) The second part of this task shall involve an inventory of the natural areas in the GREAT III region. For the purpose of this task, natural areas will be defined as unique biological communities or unique geological sites in a natural or nearly undisturbed state. The Contractor will update with secondary source data the previous natural area inventory which the state of Illinois has completed and conduct the inventory for the Missouri side of the corridor. The methodology to be utilized in collecting these data will involve a three-step process. The first step will be to identify prospective areas on a topographic map. Secondly, the prospective areas will be identified to a greater degree with existing aerial photographs. Finally, the areas in question will be evaluated by ground survey. The final inventory report will include locational maps (7.5 topographic maps) of the natural areas and a narrative describing the features of each site.

c. Task Three. The Contractor shall conduct a study to determine the current and future recreation uses of the Mississippi River and its adjacent land within the GREAT III study area. This study will determine recreation use for 1981, for the following activities:

-camping	-waterfowl hunting
-canoeing	-picknicking
-bicycling	-swimming
-hiking	-trapping
-water skiing	-wildlife viewing
-power boating	-sightseeing
-sail boating	-rapelling
-fishing	-other

In order to obtain these data, existing and new aerial photography will be utilized. New aerial photography will be flown during the summer season, at chosen sites along the river and three light plane (non-photographic) flights will be undertaken for visual surveillance. Because of limited time and money, not all recreation sites, within the study area will be used for interviews. Instead, selected sub-samples shall be chosen from each of six sections of the study area, (Pool 24, 25, 26 and three sections of the open river south of St. Louis). The number of sub-samples from each of the six sections will depend upon the extent of recreational use of each section.

For example, a larger number of sub-samples will be chosen from pool 26, which is heavily used by St. Louis residents, than one of the lesser used sections of open river in the southern part of the study area. Once the sub-samples are chosen, the use survey will employ a methodology which is consistent with a 1973-74 study entitled Recreational Use of Pool 21, Mississippi River by George G. Fleener, Missouri Department of Conservation (See Attachment 1). Interviews shall be conducted at varying times and to the extent possible, during all seasons of the year. A total of 338 on-site interview man days and a sample size of 1400 are included.

d. Task Four. Task Three, which is an on-site survey, is strictly limited to monitoring the existing facilities in the study area. Since a lack of recreation facilities obviously limits existing use, the present use may not represent the true demand. Therefore, an additional survey will be conducted to more accurately assess latent recreation demand. This would be conducted under the assumption that additional recreation facilities, as described in task two, would be readily available for use. The survey shall be conducted as follows:

(1) The Contractor shall conduct a 6000, 3-minute call random sample telephone survey in order to determine projected participation in the recreation activities described in task three. The purpose of this task is two-fold; to discover the percentage of people within a specified geographic area, who have participated in recreation within the study area; and to discover the number of people who would participate in the future if more recreational facilities were provided. Also to assess differences between known users and non-users, 10% of the calls will be made to task three interviewees.

(2) The geographic area to be selected for the telephone survey would be related to the on-site survey performed in task three. The area would include the number of circular miles in which ninety percent of the on-site interviewees travelled from to participate in recreation in the study area.

e. Task Five. Utilizing the results of tasks three and four, the Contractor shall project recreation participation in the activities described in task two for the years 1990 and 2000. The COE will make available to the Contractor the population projections (by appropriate geographic sub-areas to be used).

f. Task Six. The Contractor shall determine the need or surplus of recreation lands required to meet the 1981 and projected 1990 and year 2000 participation in the activities listed in task three. Specific facilities will not be required.

g. Task Seven. The Contractor shall prepare draft and final reports.